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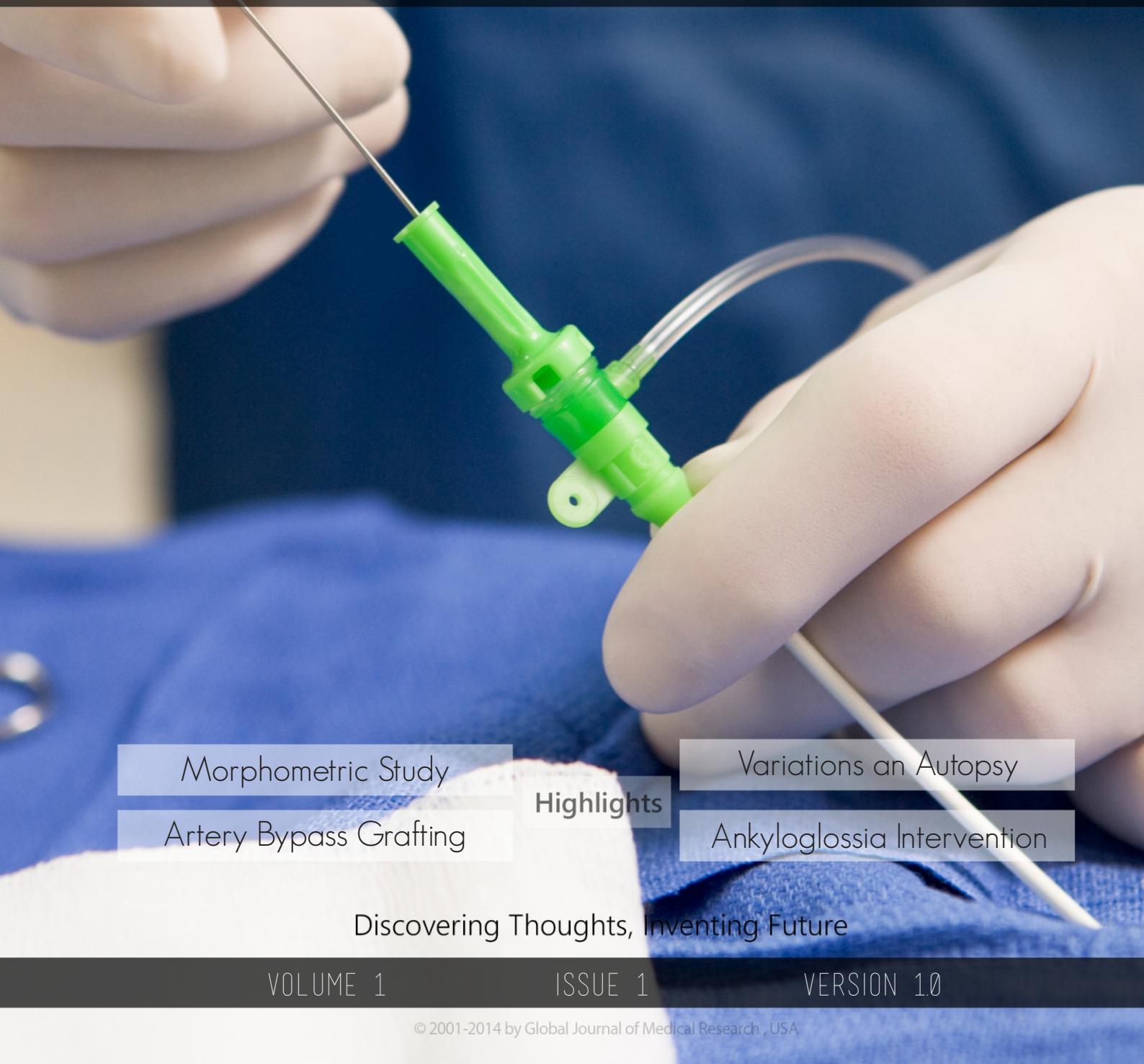

Morphometric Study

Artery Bypass Grafting

Highlights

Variations an Autopsy

Ankyloglossia Intervention

Discovering Thoughts, Inventing Future

VOLUME 1 ISSUE 1 VERSION 1.0

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Surgeries and Cardiovascular System

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Ankyloglossia Intervention is Safe Minor Surgical Procedure with Tubleless Anasthesia

By Muataz A. Al Ani & Ahmad H. Hammody
Mosul Health Organization, Iraq

Introduction- Ankyloglossia, also referred to as tongue-tie, is a congenital anomaly of the tongue characterized by short and sometimes anteriorly inserted frenulum. Ankyloglossia occurs in approximately 5% of newborn infants, at a male to- female ratio of 2.6:1(1). The clinical significance of ankyloglossia is a matter of controversy, particularly as it relates to breast-feeding difficulties; sore nipples , poor infant weight gain(2), neonatal dehydration , and shortened breast-feeding duration have been reported as possible consequences of ankyloglossia(2,4).

GJMR-I Classification : NLMC Code: WF 350

Strictly as per the compliance and regulations of:

Ankyloglossia Intervention is Safe Minor Surgical Procedure with Tubleless Anasthesia

Muataz A. Al Ani [α] & Ahmad H. Hammody [σ]

I. Introduction

Ankyloglossia, also referred to as tongue-tie, is a congenital anomaly of the tongue characterized by short and sometimes anteriorly inserted frenulum. Ankyloglossia occurs in approximately 5% of newborn infants, at a male to- female ratio of 2.6:1[(1)]. The clinical significance of ankyloglossia is a matter of controversy, particularly as it relates to breast-feeding difficulties; sore nipples [(2)], poor infant weight gain[(2)], neonatal dehydration [(3)], and shortened breast-feeding duration have been reported as possible consequences of ankyloglossia[(2,4)].

II. Patients and Method

We reviewed all the patients with the diagnosis of tongue tie between February 2007 and June 2012 who undergone a new surgical management to assess the complication and success rates.

Patients were identified from outpatient correspondence to general practitioners and pediat-ricians if they were initially referred for consideration of ankyloglossia as a cause of feeding difficulties, income-plete protrusion of the tongue out of the alveolus fig(1) ,improper phonation of some letters , small bifid tongue at the tip fig (2) with heart shape tongue and separation of the incisor teeth at older age group fig (3).

Figure 1 : Improper protrusion of tongue

Figure 2 : Heart shape tongue

Figure 3 : Separation of teeth

All patients were in a good health fasting for 4 hours (breast fed babies) or for 4-6 hours (formula fed babies) premedicated by atropine (0.01 mg/kg) intravenously at time of induction of anesthesia by mask with halothane and close monitoring .

While the baby in supine position under good light has spontaneous breathing and being deeply anesthetized the procedure started with full identification of the tongue so the tip of the tongue pulled outside and superiorly using magile forceps as shown in fig (4), then a fine needle unipolar couttery is used to cut the tie with a procedure lasting between 10-30 second only as shown in fig(5).

Figure 4 : Identification of the tongue tie

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Figure 5,6 : Fine needle couttery to cut the tie with few seconds only

Then we kept the baby in the recovery room until full recovery is achieved, the baby is fed by the mother and checked again by the surgeon before leaving the hospital.

The studied patients were relating to possible complications and some subjective indicators of success after a minimum 14 day period.

III. Result

Sixty four baby were successfully managed by this method . The mean age of babies on the day of tongue tie division was(270) days, with the youngest infant being (30) days old and the oldest(2210) days old. The study group consisted of 35 males and 29 females.

The type of feeding before the procedure was documented and included all types of feeding attempted by the mother until the date of tongue tie division. Forty mothers were at least partly breast feeding, four infants were exclusively formula fed.

Of the 44 milk fed infants(breast and formula), 35 had problems latching on. twenty three of the mothers had sore nipples and 5 had mastitis.

Thirty tow of the 40 mothers noted an improvement in the ease of feeding after the procedure, with 30 also noting an improvement in the time taken for a feed. Three of the four formula fed infants were improved in both these areas.

With regard to the complication rate, any bleeding after leaving the clinic was considered significant as well as any episodes of infection, any need to seek medical advice, and any repeat procedure required to release the tongue tie. There were no incidents of bleeding, infection and no requirement for further medical advice after this procedure.

IV. Discusion

Hall and Renfrew rightly describe the literature with relation to ankyloglossia as containing "little high quality objective evidence"; they also describe the difficulties in study methodology in this setting with particular reference to concealing the diagnosis from parents in control studies.[5] With regards to intervention, they note that significant venous bleeding could occur if technique is not meticulous but we found no reports of serious adverse events".

Ankyloglossia intervention has been performed in our center for over 25 years in the operative room with anaesthetic procedures using endotracheal tube and securing the larynx with packing to prevent aspiration of blood or any secretion to cut the tongue tie by a scissor and suturing the tongue. like in any oral surgical intervention procedure.

A study done in Glasgow, UK[6]. Which illustrate the management of tongue tie in infants as an out patients simple procedure to get red from the complication of the anesthesia is shown in table (1).

Table 1 : Complications

Complications after leaving clinic	Yes	Yes (%)	No	No (%)	Total
Bleeding	1	2	43	98	44
Pain	1	2	43	98	44
Infection	0	0	44	100	44
Further medical advice needed	0	0	44	100	44
Repeat procedure needed	2	5	42	95	44
Total	4	9	40	91	44

In this study there is bleeding ,some time the procedure is insufficient to manage the tongue tie.

The method which we used depend on the cutting diathermy using low voltage setting of the machine with tip needle like which will finish the surgery within few seconds without any evidence of bleeding and achieved sharp cutting of the tie just at the base of the tongue while the baby is deeply anaesthetized and in a time not more than the time required to put the endotracheal tube and with that number of babies Our study shows that: No indication for intubation in the management of tongue tie. And the ankyloglossia (frenotomy) can be easily treated with a low complication using a unipolar cutting diathermy and under tubeless anesthesia.

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Morphometric Study on Septal Papillary Muscles of Human Tricuspid Valve

By Dr. Harsha B. R & Dr. Dakshayani K. R
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Abstract- *Background:* Aim of the present study was to observe the measurements of septal papillary muscles present in tricuspid valve of human heart. Measurements of septal papillary muscles in tricuspid valve gains utmost importance in cardiac surgeries because they are the causes of myocardial infarction in recent times because of its variations and detection of these causes by advent in modern technologies which will help in treatment of tricuspid valve diseases.

Materials and Methods: This study was carried out on 96 normal formalin fixed human heart specimens. Dissection was performed according to standard techniques. Septal papillary muscles were observed and length, width and thickness of each muscle are measured and documented.

Results: In the present study, numbers of septal papillary muscles were present with a frequency of 0-2, with most common appearance of 1 muscle in 67 hearts (69.8%) and least common incidence of 2 muscles in 6 hearts (6.3%). Septal papillary muscles were present in 73 (76%) hearts. In measurements, septal papillary muscle mean height was 0.7±0.22 cm, mean width was 0.48±0.16 cm and mean thickness was 0.34±0.12 cm respectively.

Keywords: *tricuspid valve, papillary muscle, morph-ometry.*

GJMR-I Classification : *NLMC Code: WG 168*

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Conclusion: We hope this study will serve to understand the morphometry of septal papillary muscles better and will help in various surgical procedures and cardiac treatment done on tricuspid valve.

Keywords: tricuspid valve, papillary muscle, morphometry.

I. Introduction

The opening of a new field of surgical endeavour often arouses interest in the detailed study of the anatomy of the involved part of the body. As a result of such studies, current notions may be changed and extended so as to understand better. The impetus given to tricuspid valve surgery in the course of the last few years has prompted revision of our knowledge concerning the anatomy of the normal. In present study the morphometry of septal papillary muscles in tricuspid valve were studied and then compared with the works of many eminent scientists in this field.

The atrioventricularvalvular complex in both right and left ventricles consists of the orifice and its annulus, the cusps, the supporting chordae tendinae of various types and the papillary muscles. Tricuspid valve is made up of six major components:

1. Right atrial wall
2. Annulus
3. Three leaflets
4. Chordae tendinae
5. Papillary muscles
6. Right ventricular free wall.

Harmonious interplay of all these, together with the atrial and ventricular myocardial masses depends on the conducting tissues and the mechanical cohesion provided by the fibro elastic cardiac skeleton.

All parts change substantially in position, shape, angulation and dimensions during a single cardiac cycle. The papillary muscles were small muscle groups which were present in ventricular wall and attached to cusps of valve by chordae tendinae. They contract to prevent invert or prolapse of valve. There are 2 major and 1 minor papillary muscle in the right ventricle. The major papillary muscles are located in the anterior and posterior positions. The minor papillary muscles have a medial position along with several smaller and variable muscles attached to the ventricular septum.

Septal or medial papillary muscle: Is small, but typical and arises from the posterior septal limb of the septomarginaltrabeculae. It is often formed of several muscles of which one may be longer and more constant.

All the papillary muscles supply the chordae to adjacent components of the leaflets they support. The septomarginaltrabeculae (moderator band) is more or less isolated trabeculae of the bridge type, which extends from the interventricular septum to the base of the anterior papillary muscle in the lower part of the ventricle. It contains conducting myofibers from the right limb of the atrioventricular bundle[1].

II. Materials and Methods

The study was carried out on 96 formalin fixed human hearts from patients who had died of non-vascular causes and were autopsied. No gross abnormality of the tricuspid valves was noted. Study was done without any grouping of specimens on the basis of sex and age. Dissection was performed according to standard autopsy techniques. The Tricuspid valve was opened by a scalpel knife cut passing from the right atrium to the apex of the right ventricle through the lateral or acute margin of the ventricle. The interior of the

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heart was washed and all the blood clots were removed. The second cut was made along the anterior surface of the heart just left to the intra-ventricular groove from apex of the ventricle to annulus; care was taken not to damage the papillary muscles. Each muscle were measured by using Vernier callipers and documented.

The data were summarised using descriptive statistics like frequency (number of papillary muscles), mean, standard deviation, range and 95% confidence interval (measurement of papillary muscles). All the statistical calculations were performed using software SPSS for windows {Statistical Package for Social Service (SPSS) Inc, 2004, New York} version 13.0.

III. Observations and Results

In the present study, number of septal papillary muscles was present with a frequency of 0-2. Maximum numbers of papillary muscles were 1 seen in 67 hearts (69.8%) and minimum numbers of papillary muscles were 2 seen in 6 hearts (6.3%). Septal papillary muscles were present in 73 hearts (76.1%). Maximum numbers of papillary muscles were 2 seen in 6 (6.3%) hearts and minimum number of muscles was only 0 seen in 23 (24%) hearts.

In measurements of papillary muscles, septal papillary muscle mean height was 0.7±0.22 cm, mean width was 0.48±0.16 cm and mean thickness was 0.34±0.12 cm respectively.

IV. Discussion

The number, length and shape of papillary muscles and chordae tendinae in the right ventricle are variable. This can be of clinical significance, since the papillary muscles play an important role in right ventricle contraction by drawing the Tricuspid annulus towards the apex, thereby causing shortening of the long axis and the chamber becoming spherical for ejecting blood.[2]

Table 1 : Comparison of incidence of septal papillary muscles

Sl. No.	Studies	No. cases studied	Percentage of septal papillary muscles
1	Present study	96	95.8%
2	Balachandra N[3] et al.	96	100%
3	Gerola LR[4] et al.	50	100%
4	Nigri GR[5] et al.	50	78.5%
5	Motabagani MAB[6]	10	100%
6	Begum[7] et al.	50	76%
7	Wafae N[8] et al.	50	100%

Observation regarding the percentage of papillary muscles in the present study was in not agreement with the work of all the eminent workers except Nigri GR et al. and Begum et al. Possible reason for such difference is the number of specimens, geography and race of specimens studied. With other workers result is slightly differs.

In the present study all the papillary muscles were measured for height, width and thickness. Mean height of SPM was 0.7 cm ranged between 0.3 cm to 1.3 cm, mean width was 0.5 cm ranged between 0.2 cm to 0.8 cm and mean thickness was 0.3 cm ranged between 0.2 cm and 0.7 cm.

Comparison of this observation with other studies is as follows.

Table 2 : Comparison of measurements of septal papillary muscles

Sl. No.	Studies	No. cases studied	Measurements of septal papillary muscles (cm)		
			Mean height	Mean width	Mean thickness
1	Present study	96	0.7±0.2	0.5±0.2	0.3±0.2
2	Gerola LR[4] et al.	50	1.1±0.3	1.2±0.3	-
3	Nigri GR[5] et al.	79	0.6	-	-

Observations of mean height was significantly agreed with other workers but mean width is not in agreement with Gerola LR et al. possible reasons for this difference may be specimen number of the both the study and also racial and geographical difference. But none of the above mentioned authors commented about thickness of the papillary muscles.

Anatomical variations of papillary muscles would be useful in newer surgical techniques like papillotomy and commissurotomy in rheumatic lesions, leaflet resection in advanced myxomatous lesions, excision of infective vegetation, transfer and rotation of leaflet segments in traumatic conditions and in correction of papillary rupture induced Tricuspid regurgitation. Tricuspid valve in congenital anomalies like Ebstein's malformations, dysplasia, straddling is complicated because the tendinous chords and papillary muscles are often abnormally short and thick. So knowledge of a detailed morphology of papillary muscle is more and more necessary for cardiothoracic surgeries of these conditions.[9]

Conclusion: The present study to understand the anatomy of the constituent parts of the tricuspid valve complex not only helped examination of these parts in cross sectional interrogation but also enhanced appreciation of valvular anomalies. Knowledge regarding high variability of papillary muscles in the valve is helpful in corrective treatment of congenital disease like Ebstein's disease and severe functional Tricuspid regurgitation. Any variation in the attachments of muscle and their number, size and shape or their absence may cause prolapse of the leaflets. Regurgitation is a consequence of deformity, shortening and retraction of one or more leaflets of the Tricuspid valve as well as shortening and fusion of the papillary muscles.[10]

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Medical Management of Patients with Modified Intestinal Bypass: A New Promising Procedure for Morbid Obesity

By Abduh Elbanna, Nader Hashim Taweela, Mohamed Bakheet Gaber, Mohamed Mostafa Tag El-Din, Mohamed Fathy Labib, Mohamed Abd Elfattah Emam, Osama Osman Khalil, Mona Mohamed Abdel Meguid & Abd Elrazek M. Aly Abd Elrazek

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Abstract- *Background and Aim:* Obesity is a chronic disease that is increasing in prevalence worldwide. Bariatric surgery could be the definitive clue in many situations. Medical management and follow up of patients who have undergone bariatric surgery is a challenge opportunity due to post operative complications. A new modified intestinal bypass (MIBP) operation was designed to maintain good digestion and selective absorption with less medical and surgical complications.

Patients and Methods: We experienced 156 patients medical follow up ; 122 females (78.2%) and 34 males (21.8%) , who have undergone a new modified intestinal bypass (MIBP) surgery ; (Elbanna operation) as well as we evaluated Excessive weight loss (EWL), nutritional supplements, motility disorders, and fatty liver for consecutive 3 years after operation.

Keywords: *bariatric, gastrointestinal, obesity, modified intestinal bypass (MIBP), laparoscopic, elbanna.*

GJMR-I Classification : *NLMC Code: WG 169, WI 900*

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Conclusion: MIBP surgery (Elbanna operation) solved the medical problem of nutritional deficiency post intestinal bariatric surgeries. Our concept changed from maldigestion and malabsorption to good digestion and selective absorption.

Keywords: bariatric, gastrointestinal, obesity, modified intestinal bypass (MIBP), laparoscopic, elbanna.

I. Introduction

There are several well-established health hazards associated with obesity e.g.: NASH, type 2 diabetes, heart disease, GERD, GI motility disorders, sexual disorders , depression and others. The risk of development of such complications rises with increasing adiposity, while weight loss can reduce the risk [1]. Weight loss is encouraged in any mean to overcome morbidity and diseases –affecting survival. For patients with BMI ≥40 kg/m2 who have failed to lose weight with diet, exercise and drug therapy, and those with BMI >35 kg/m2 with obesity -related comorbidities, bariatric surgery become the clue, whatever the laparoscopic bariatric approach is preferred over the open approach [2].Medical management and follow up of patients who have undergone bariatric surgery is a challenge opportunity for a skilled Gastroenterologist, including an assessment and treatment of possible nutritional defects, eating disorders, dysmotility syndrome, elevated liver enzymes and psychosocial problems. Occasionally, patients develop vomiting and nutritional deficiencies as a result of food intolerance and malabsorption respectively after bariatric surgery [3,4]. As well as chronic medical conditions; D.M, Hypertension and Non Alcoholic Steatohepatitis (NASH) improve after bariatric surgery, clinicians should monitor medications' doses after the surgery in an intimate follow up [5, 6]. Gastroenterologist should have much knowledge –related different and recent bariatric procedures to expect further complications and follow up accordingly.

II. Patients and Methods

We have experienced 156 patients medical follow up; 122 females (78.2%) and 34 males (21.8%), aged 21 to 52 years old; (39.7 ± 9.2) mean age, with morbid obesity BMI ≥40 kg/m2 who have undergone (MIBP) in the period from December 1999 to December 2010. All subjects have undergone a new modified intestinal bypass MIBP surgery (Novel Elbanna bariatric surgery). Subjects were followed up for 3 years after the novel procedure, as well as we evaluated nutritional supplements, eating disorders, vomiting, and other post operative complications. Follow up included EWL and Evaluation of (ca++), albumin, Hg, iron, zinc, B12 and PC levels at the time of operation, 3, 6 and 12 months postoperatively and every year thereafter for 3 years.

We retrospectively reviewed their data, in the Gastroenterology-Bariatric Units of Al Azhar University Hospitals- faculty of Medicine, and other private centers-Arab Republic of Egypt.

All patients presented with comorbidities of DM, Hypertension, Cardiac problem, Respiratory failure Type

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l or NASH at the time of presentation, all patients were non-alcoholic due to religious belief. Alcoholic patients were excluded from our study.

The study was conducted with the approval of the Institutional Board committee of Al Azhar University Hospitals Committee-Cairo-Egypt. We received informed written consent form each patient.

III. Statistical Study

Statistical analysis was used to determine the association between the BMI and each case group of non-alcoholic patients presented with morbid obesity, Qualitative data of EWL (Excessive weight loss) were expressed as number and percentage.

Data were statistically described in terms of mean ± standard deviation (M± SD). Comparison among different time points was done using one way analysis of variance (ANOVA) test with posthoc multiple 2-group comparisons. *p* values less than 0.05 was considered statistically significant. All statistical calculations were done using computer programs SPSS (Statistical Package for the Social Science; SPSS Inc., Chicago, IL, USA) version 15 for Microsoft Windows.

IV. Results

Significant EWL post operatively after three months (35), six months (57%) , one year (71%) , two years (80%) , three years (84%), followed by nearly a stationary course till the moment.

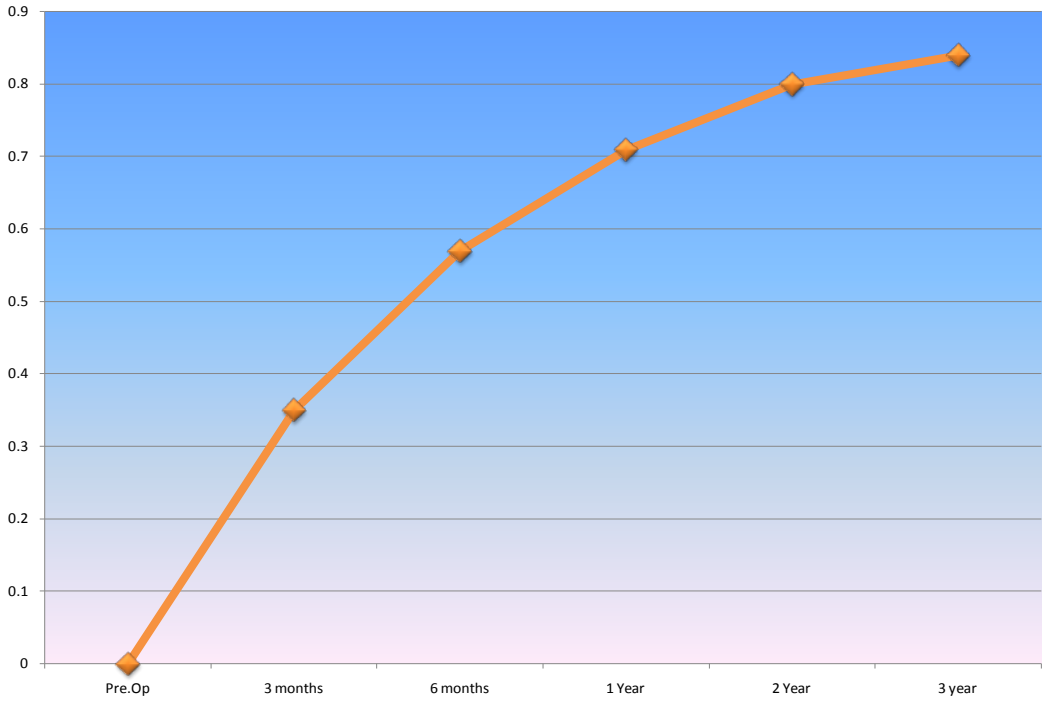
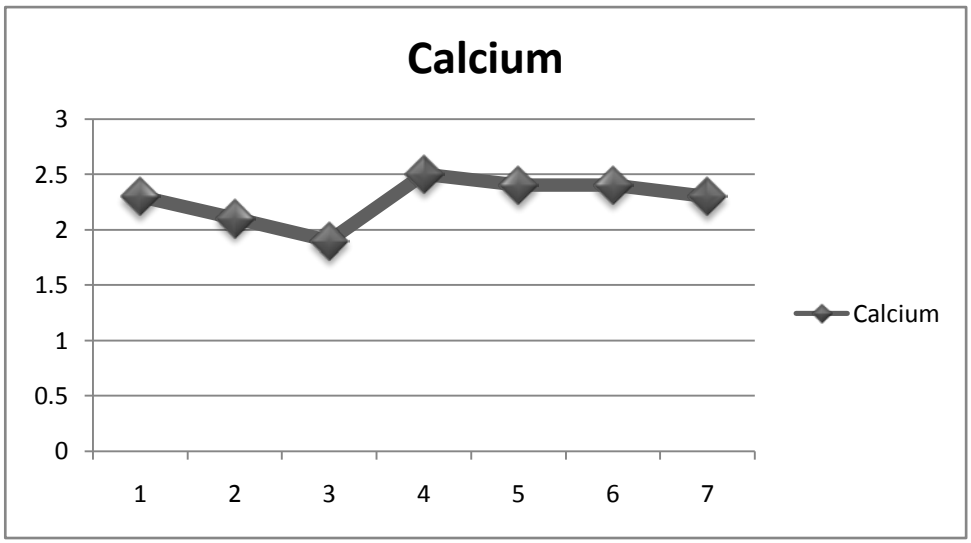


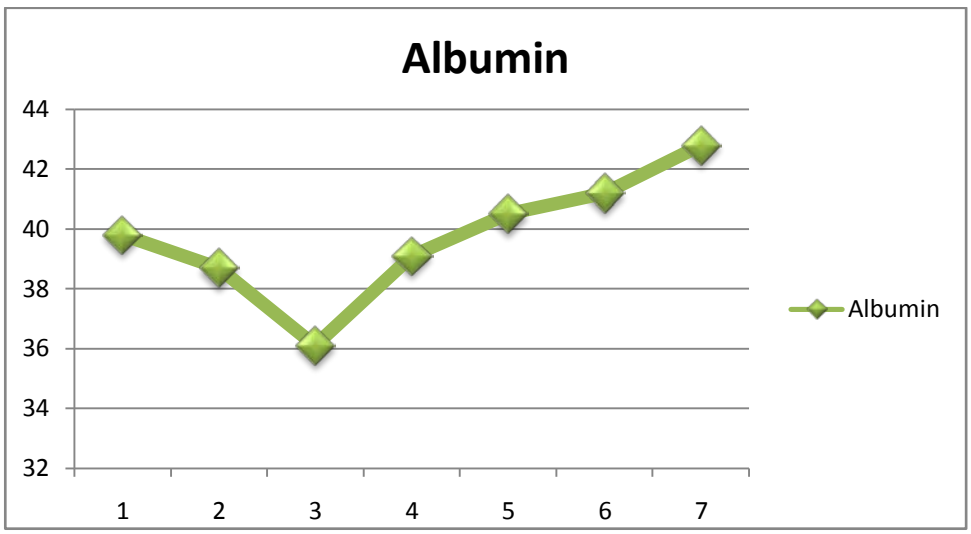
Figure 1: showing EWL through 3 years post operative

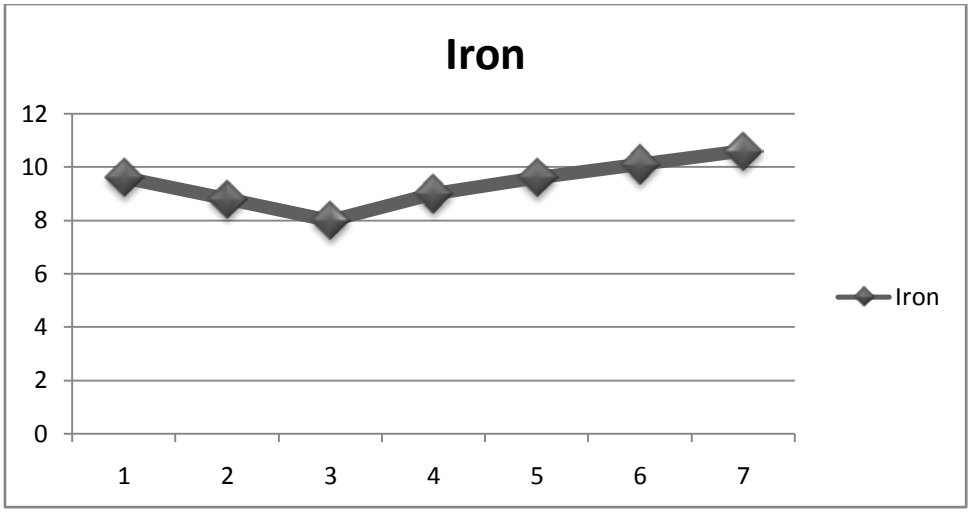
Zinc and hemoglobin decreased at 3, 6 months post operatively. For $B_{12,}$ significant decrease occurred at 6th month followed by significant increase in the 1st year and thereafter. Albumin decreased only between 3rd and 6th month otherwise became normal all over the study. Iron shows significant decrease at 3, 6 months and 1st year post-operative followed by significant increase to normal levels the rest of follow up period. Prothrombin concentrations showed no changes. Table (1) & Diagram (1).

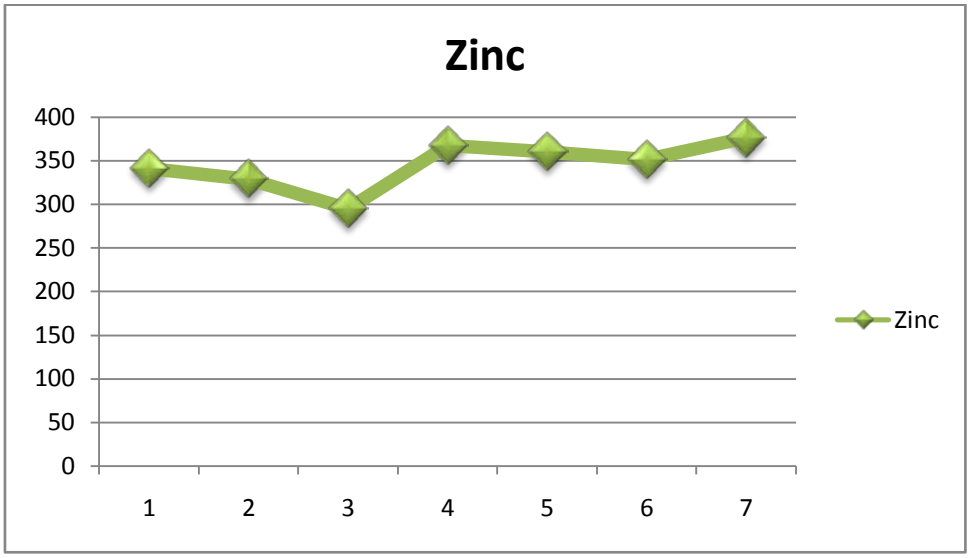
Table 1 : showing the significant different changes in (Mean) Laboratory parameters and EWL through 3 years duration post operative

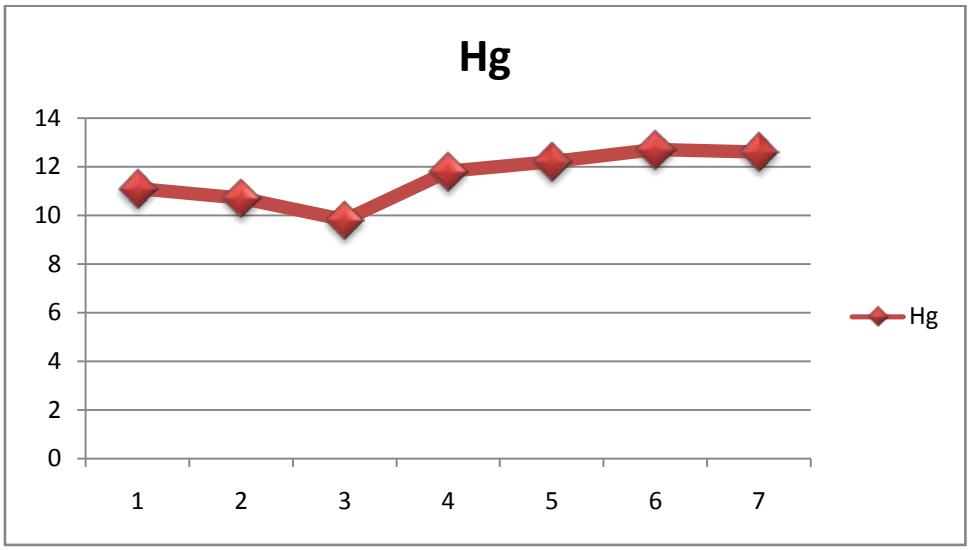
Time of Follow Up	*Pre.Op*	*3 months*	*6 months*	*1 year*	*18 months*	*2 Years*	*3 Years*
EWL %	0	35	57	71	78	80	84
Calcium (mmol/L)	2.3	2.1	1.9	2.5	2.4	2.4	2.3
Albumin (g/L)	39.8	38.7	36.1	39.1	40.5	41.2	42.8
Iron (umol/L)	9.6	8.8	8.0	9.0	9.6	10.1	10.6
Zinc (umol/L)	11.1	10.7	9.8	11.8	12.2	12.7	12.6
Hg (g/L)	121.2	116.9	119.2	122.8	121.6	120.4	123.8
Vit.B12 (Pmol/L)	341.3	328.8	295.2	367.5	360.6	351.3	376.4
Proth.Con. %	92.3	90.6	92.7	91.0	92.5	93.9	92.6

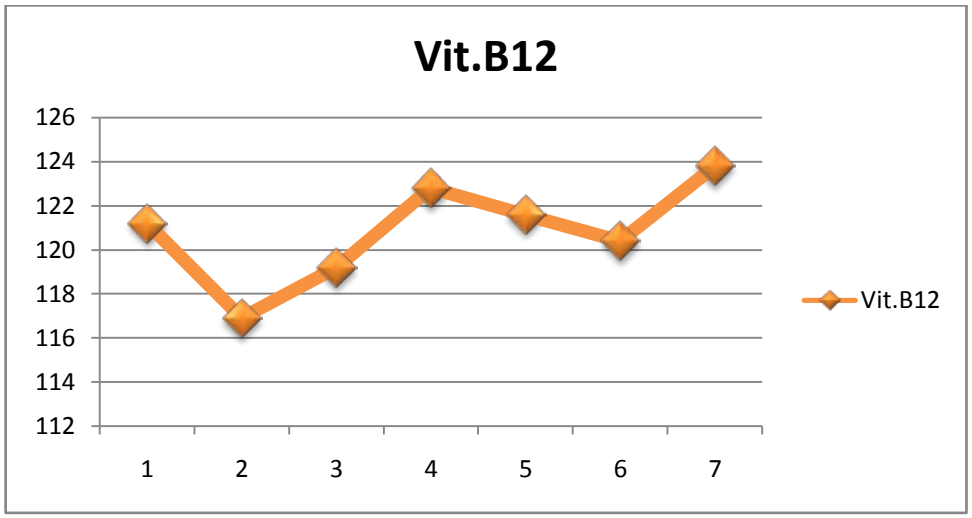












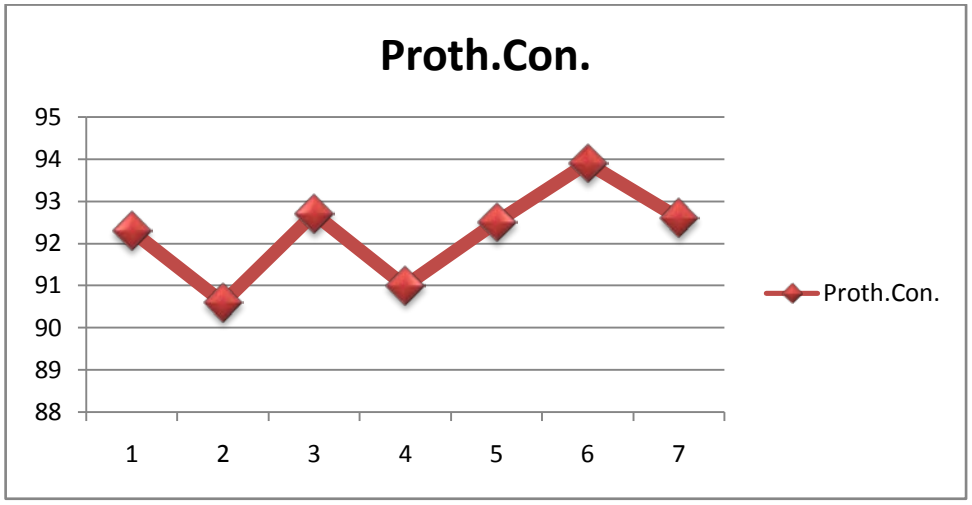


Diagram 1 : showing post Elbanna operative follow up

Aim of Good digestion and selective absorption, was the target without vital deficiency.

Most of the element deficiencies in our study occurred in the period of maximum weight loss.

No vitamins or minerals supplementations were reported, only dietary intake rich in vitamins, proteins and iron was encouraged.

No significant difference between male and female outcome.

Post operative complications were reported as follow:

Bleeding: (3.1%); 5 patients.

Leak at the site of anastomosis: (2.5 %) ; 4 patients.

Infection: (13.3 %); 21 patients.

Mortality (0.6 %); 1 Patient.

Internal Hernia :(0.6 %); 1 patient.

Incisional Hernia : (1.3%) ; 2 patients

Abdominal distension: (31.2 %); 49 patients.

Vomiting: (41.4 %); 65 patients.

Motility disorders (41.4%); 65 patients.

Hypoglycemia; Early: (5.09 %); 8 patients, late: (1.9%) 3 patients.

Cholilithiasis: (0.6 %); 1 patient.

Renal stones: (0.6 %); 1 patient.

Failure to lose weight; (0.6 %); 1 patient.

Failure to regain weight: (1.3 %); 2 patients.

Table (2).

Table 2 : showing reported complications of (MIBP); Elbanna Novel Operation

Serial	Reported Complication	Number & percentage of patients
1	Bleeding	(3.1%); 5 patients
2	Leak	(2.5 %) ; 4 patients
3	Infection	(0.6 %); 1 patient
4	Internal Hernia	(0.6 %); 1 patient
5	Incisional hernia	(1.3%) ; 2 patients
6	Abdominal Distension	(31.2 %); 49 patients
7	Vomiting	(41.4 %); 65 patients
8	Motility disorders	(41.4%); 65 patients
9	Hypoglycemia (Early)	(5.09 %); 8 patients
10	Hypoglycemia (Late)	(1.9%) 3 patients
11	Cholilithiasis	(0.6 %); 1 patient
12	Renal Stone	(0.6 %); 1 patient
13	Failure to lose weight	(0.6 %); 1 patient
14	Failure to gain weight	(1.3%) ; 2 patients
15	Pulmonary embolism	-
16	Mortality	1

V. Discussion

Obesity is a chronic disease that is increasing in prevalence worldwide. In 2010 the prevalence of obesity was 35.5 and 35.8 percent among adult American men and women, respectively. In Canada more than 27 percent of men and 23 percent of women are obese. Reported prevalence rates of obesity include 23 percent of men and women in the UK (2009), 24 percent of men and 34 percent of women in Mexico (2006) and 9 percent of men and 27 percent of women in South Africa (2003). [7,8,9]. These data and those from other countries are indicative of a major international epidemic, a steady and distressing increase worldwide.

The medical rationale for weight loss in obese subjects is that obesity is associated with a significant increase in mortality and many health risks affecting quality of life including type 2 diabetes mellitus, hypertension, dyslipidemia, stroke, NASH and coronary heart disease.

Large epidemiologic studies have evaluated the relationship between obesity and mortality, in order to monitor patients, especially those with NASH [10]. In general, greater BMI is associated with increased rate of death from all causes and from cardiovascular disease (CVD) and NASH-induced decompensated cirrhosis. This is particularly true for those with severe obesity. Being overweight also appears to be associated with decreased survival in some studies [11, 12, 13]. Unfortunately obesity became a worldwide stigma, currently obese subjects are often exposed to public disapproval because of their fatness affecting significantly their psychosocial behavior. All patients who are obese (BMI ≥30 kg/m2) should receive counseling on diet, lifestyle, and goals for weight management. Individuals with BMI ≥40 kg/m2 and those with BMI >35 kg/m2 with obesity-related comorbidities who have failed diet, exercise, and drug therapy, bariatric surgery should be considered.

Bariatric surgery is one of the fastest growing operative procedures performed worldwide, with an estimated >340,000 operations performed in 2011. While the absolute growth rate of bariatric surgery in Asia was 449 percent between 2005 and 2009, the number of procedures performed in the United States have plateaued at approximately 200,000 operations per year [14, 15]. All bariatric operations concerned with restrictive and / or malabsorption maneuvers; less food intake and malabsorption concept. The most common operations performed worldwide are Roux-en-Y gastric bypass (RYGB), the laparoscopic adjustable gastric band (GB), and the sleeve gastrectomy (SG). Unfortunately many complications reported following bariatric procedure, vary based upon the procedure performed and can be as high as 40 percent. The overall 30-day mortality for bariatric surgical procedures worldwide is less than 1 percent , this compares favorably with the hospital mortality of other frequently performed major surgical procedures Medical follow up following intestinal bypass bariatric surgery is important

to evaluate each post operative step individually. Early periodic hypoglycemia, vomiting, marginal ulceration, cholilithiasis, metabolic and nutritional derangements, renal disorders, electrolyte imbalance and liver cirrhosis are challenging medical problems should be concerned and evaluated by an expert Gastroenterologist. The most common causes of early mortality are pulmonary emboli and complications related to leaks, furthermore, Gastroenterologist should have much knowledge – related different intestinal bariatric procedures to expect further complications accordingly.

A new trend of bariatric operation; Modified Intestinal Bypass (MIBP) with or without fundal resection; (Elbanna Technique), Figure (1) has been evaluated in 156 patients; 122 females (78.2%) and 34 males (21.8%), presented with morbid obesity, the technique was presented as a new promising bariatric surgical technique in the 18th World Congress of the International Federation for the Surgery of Obesity & Metabolic Disorders (IFSO) 2013 [16], by which we can avoid vitamins and trace elements deficiency obtained following other surgical bariatric diversion techniques, e.g.; BPD/DS (biliopancreatic diversion with or without duodenal switch), Roux en Y, MGB (Mini Gastric Bypass), and sleeve bypass Figure (2), and to preserve biliopancreatic secretions, in addition to preserve anatomical external biliary pathway, by which ERCP can be performed if surgical obstructive jaundice develops early or late after the bariatric procedure.

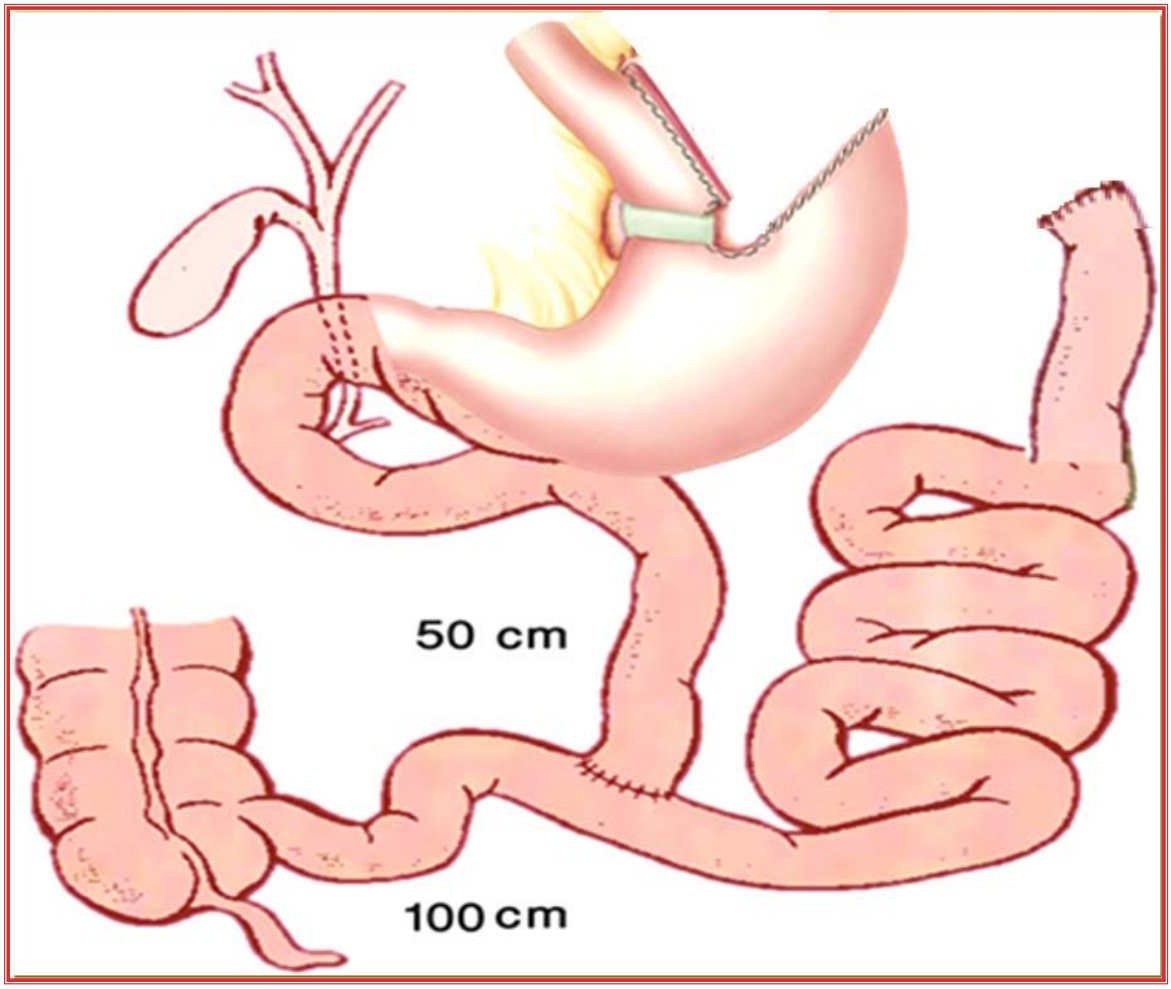


Figure 2 : (Novel Elbanna Procedure) at 50 cm from the dudenojejunal flecture we transect the jejunum. Reanastomosis is performed between the proximal jejunum and the terminal ileum 100 cm from the ileocaecal valve. Duodenum, Proximal 50 cm of jejunum and 100 cm of terminal help the physiological absorption.Preservation of the anatomical biliary drainage and enterohepatic circulation are the most procedural advantage. Fundal resection performed to get maximum effect on appetite and satiety.

Anatomical, surgical and physiological idea behind the novel Elbanna procedure is to preserve the gastrointestinal anatomy as far as we can, where most of the digestive enzymes, HCl, hormones and intrinsic factors are secreted. Absorption of digested amino acids & biliopancreatic enzymes essential for digestion of protein and fats to extract vitamins, vitamins and minerals occur in the preserved segments. Following

Elbanna procedure, preservation of the duodenum, proximal 50 cm of the jejunum and the distal 100 cm of the ileum helps absorption of calcium, iron, phosphorus, magnesium, fat-soluble vitamins, minerals, thiamine and Vitamin B12. The novel procedure maintains the physiological entero -hepatic circulation.

In 156 patients who have experienced the technique we followed them clinically, sonographicaly and, laboratory; CBC, (Ca++), albumin, iron, zinc, Vitamin B12 and Prothrombin Concentration (PC) were measured at 3 months, six and twelve months postoperatively and every year thereafter for 3 successive years. Diagram (1).

Patients showed significant EWL Figure (1), in addition no significant decrease in minerals, vitamins or proteins were reported Table (1, 3). Patients did not need vitamins or albumin supplementation, whatever the clinical outcome related – GI motility disorders did not difference than other bariatric procedures Figure (3). Patients appeared in better contour 1 year after the procedure Figure (4 & 5).

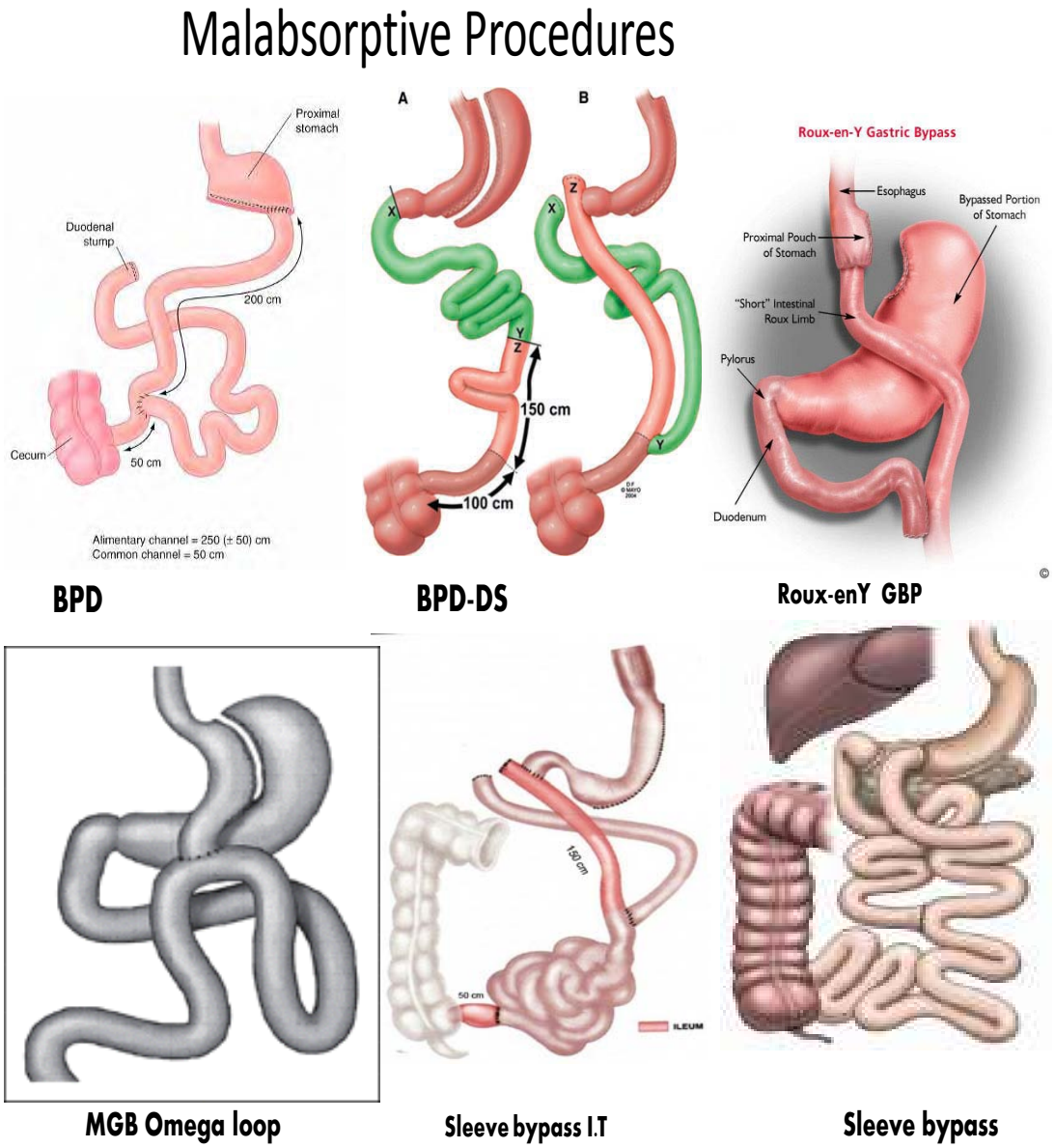


Figure 3 : diabetic

Male Patient 24 Years Old;
1-The Day of operation; 225 Kg, BMI was 71
2-8 months after operation; 95Kg;BMI is 30

Figure 4

Figure 5

We reported only one case mortality due to cardiogenic shock. However, we reported many complications as listed in results. Patients who underwent this procedure did not show significant complications, including arthritis, protein malnutrition, vitamin deficiencies, cirrhosis, neurological complications or renal failure. The most common causes of early rehospitalization are nausea, vomiting, abdominal pain, abdominal distension, dehydration, early hypoglycemia and wound problems.

Patients with eating disorders, distension or motility disorders should be evaluated clinically; prescription of triple therapy of prokintetic drug, natural anti-spasmodic and PPI was very effective especially in early post operative period in all patients. Lifestyle changes are important component of managing motility disorders includes smoking cessation, head of bed elevation, and avoidance of chocolate, caffeine, spicy foods, alcohol, beverages, fatty meal and other foods that exacerbate GI symptoms. Also lifestyle changes are very important as initial approach for those presented with mild or infrequent symptoms of vomiting and or GERD. The problematic fatty accumulation (Fatty Liver) was reported due to rapid loss of weight which recovered clinically and disappeared sonographicaly after 1 year of the procedure, ultimately we recommend

gradual loss of weight with a maximum 7-8 Kg/month loss of weight. All patients presented with comorbidities of DM, hypertension, cardiac problem, respiratory failure, NASH, sexual life disorders and / or psych-osocial intolerance showed significant impro-vement either clinically or by U/S,CT, Respiratory tests or echocardiography investigation modalities. We always stress the importance of eating all meals, particularly breakfast. Adolescents have undergone bariatric surgery should be informed that skipping meals does not help with weight control, unfortunately may promote weight gain and nutritional deficiencies.

We recommend early therapy with IV Pantoprazole and prokintetic medications if marginal ulceration detected endoscopicaly.

In a Conclusion, now bariatric surgery passes through a plateau phase, medical management and follow up of patients who have undergone bariatric surgery which is a challenge opportunity, accordingly the novel (MIBP) El Banna operation concept is to change maldigestion and malabsorption concept of bariatric procedures to good digestion and selective absorption.

VI. Limitation of the Study

Our methods of research, clinical and even surgical skills played the major role in all information mentioned in the study, hence we encourage other researches from different countries may show more significant results according to different environments, dietary habits and cultures.

VII. Future Recommendation

Whatever obesity is a worldwide epidemic, affecting also children, we have to innovate techniques in pediatric bariatric surgeries, accordingly to save our children from pre- mature morbidities and mortalities, El banna pediatric modified technique ; New Bariatric surgical technique in pediatric obesity, could be a new innovation in coming days !

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An Anatomical Study on Variations in Relation to Musculaocutaneous and Median Nerve of Upper Limb

By Dr. Shashanka M. J, Dr. Swaroop N & Dr. Girish V. P
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Abstract- *Background:* Variations in the formation of brachial plexus and in the course of its branches are not as uncommon as was once thought. Anatomical knowledge of the variations about formation, course, termination of median and musculocutaneous nerve is extremely important in surgical exploration and administration of neuromuscular blocks in axillary region. This awarenesshelpful while planning reconstructive flap surgeries and treatment of fracture of humerus.

Materials and Methods: This study was carried out on 40 normal formalin fixed upper limb specimens of 20 cadavers. Dissection was performed according to standard techniques. Variation in the origin, course, branching pattern, termination and relationship between median and musculocutaneous nerve were noted and documented.

Results: In the present study, out of 40 specimens absence of musculocutaneous nerve was noted in 5% of the limbs. In those 5% limbs median nerve showed variation in origin, course and termination.

Conclusion: This study will serve to understand the anatomical relationship between median and musculocutaneous nerve and it will help in various surgical procedures done on upper limb.

Keywords: *musculocutaneous nerve, median nerve, brachial plexus.*

GJMR-I Classification : *NLMC Code: WL 314, WS 270*

Strictly as per the compliance and regulations of:

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I. Introduction

Ventral rami of spinal nerves from C5 to T1 form Brachial plexus. Brachial plexus also convey sympathetic nerves for upper limb from T2 to T6 spinal segments. Their formation starts in Posterior triangle and they give terminal branches in Axilla.Roots give branches to Serratus Anterior (C5, 6, 7) and Rhomboideus (C5). Roots C5 and C6 join to form Upper Trunk. Root C7 continues as Middle Trunk. C8 and T1 Roots join to form Lower Trunk. Trunks are found in Posterior triangle. Upper Trunk gives a branch to Subclavius muscle (C5, 6) and Suprascapular nerve. Each trunk divides in an anterior and a posterior division so that three anterior and three posterior divisions are formed. The anterior divisions of Upper and Middle Trunk join to form Lateral Cord. Anterior division of Lower Trunk continues asMedial Cord. Posterior divisions of all the three Trunks join to form the Posterior Cord. Cords are seen in Axilla and named according to their relation with second part of Axillary artery. Branches from Cords are given around third part of Axillary artery.Branches of Lateral Cord are: 1) Lateral Pectoral2) Musculocutaneous 3) Lateral Root of Median nerve. Branches of Medial Cord are: 1) Medial Pectoral 2) Medial Cutaneous nerve of arm 3) MedialCutaneous nerve of fore arm 4) Ulnar nerve 5) Medial root of Median nerve.Branches of Posterior Cord are: 1) Upper Subscapular 2) Nerve to LatissimusDorsi also known as Thoracodorsal nerve 3) Lower Subscapular 4) Axillary nerve 5) Radial nerve. Median Nerve (Mn) is formed by union of Lateral Root from Lateral Cord and Medial Root from Medial Cord of Brachial plexus. Median nerve does not give any branch in the arm unless the nerve to Pronator Teres is unusually high. Musculocutaneous nerve (Mcn) supplies Coracobrachialis, Biceps and Brachialis muscles. It gives articular branches to Shoulder and Elbow joint, its cutaneous supply includes skin over anterolateral aspect of fore arm till the base of Thenar eminence.[1]

II. Materials and Methods

Forty limbs(Rt: 20; Lt: 20) from 20 embalmed cadavers were utilized during the study period of three years. The pectoral region,the axilla, the arm, cordsand the branchesofthe infraclavicular part of the brachial plexuswere dissected. The variations of median and musculocutaneous nervewere noted.

Observations: The musculocutaneous nerve was absent in 2 upper limbs of the same cadaver, median nerve showed varied anatomical pattern in respect to origin, course and termination.

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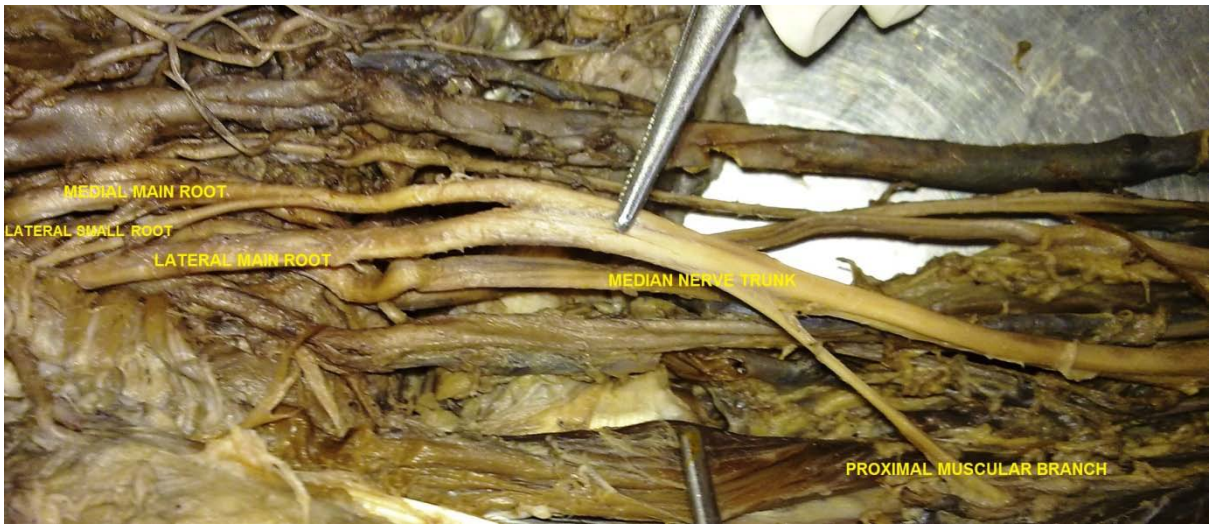

Fig.1 : Left upper limb specimen showing absence of Musculocutaneous nerve and 3 roots of Median nerve

In left upper limb, the musculocutaneous nerve was found absent and median nerve was arising from three roots (2 from lateral cord and 1 from medial cord of brachial plexus), during its course in arm it was observed that nerve giving one proximal and one distal branch. Proximal branch supplying coracobrachialis, biceps brachii, and brachialis. Distal branch arise from lateral side of nerve and passes below the biceps brachii to continue as lateral cutaneous nerve of forearm.

Fig. 2 : Right upper limb showing absence of Musculocutaneous nerve and separate muscular branches arising from Median nerve

In right upper limb of the same cadaver, musculocutaneous nerve was found absent. The median nerves arising normally, but during its distal course in the arm it was observed that the nerve was giving separate individual branches to all the musclesof anterior compartment of arm and passing under the brachial artery from lateral to medial side.

Fig. 3 : Right upper limb showing Median nerve passing under the brachial artery

Lateral cutaneous nerve of forearm arising separately from the median nerve in the lower third of the arm passing below the biceps brachii and emerge on its lateral side distally. In rest of the specimens normal anatomy of both nerves and their relationship was maintained.

III. Discussion

Multiple variations of Brachial plexus havebeen documented by Henry Hollinshead in 1969[2]. Uzan[3] found three Roots from Lateral Cord and one Root from Medial Cord. These roots united to form Median nerve. In the present study one specimen shows two roots from lateral cord and one from medial cord. Jahanshahi M [4] described absence of Musculocutaneousnerve and muscles normally supplied by it were supplied by Median nerve, however the Median nerve was formed in normal way. In our case Median nerve has three Roots, which is a variation, as Median nerve is normally formed by two Roots.Satyanarayan N [5] describes three unilateralcases of variations in the formation of Mediannerve. In the first case, the Median nerve was formed on the medial side of Axillary artery and also at a higher level. Later the Median nerve continued behind the Brachial artery and received a communicating branch from Lateral Cord of Brachial plexus. In the second case, formation of Median nerve was by three Roots, two Roots from Lateral Cord and one Root from Medial Cord. In the third case, Median nerve was formed by four Roots, three Roots from Lateral Cord and one root from Medial Cord. We have found three Roots of Median nerve in one left limb specimen which was in agreement with second case of above mentioned author. The musculocutaneous nerve (C4–C6), a mixed peripheral nerve, arising from the lateral cord of the brachial plexus in the axilla, usually innervates the muscles of the anterior compartment of the arm and then continues as the lateral cutaneous nerve of the forearm[6]. PrasadaRao [7]reported two cases of absent musculocutaneous nerve from the lateral cord of the brachial plexus. In the present study, the absence of the musculocutaneous nerve was observed in 2 specimens of same cadaver. Ihunwo et al [8] reported a case of the bilateral absence of the musculocutaneous nerve from the lateral cord of the brachial plexus, with four branches arising from the lateral sideof the median nerve. This report was in correspondence with that of the present study with little anatomical variations.Combination of absence of Musculocutaneousnerve and three roots of Median nerve as seen in the present case is a rare occurrence. Knowledge of this variation is crucial while performing block dissection of Axilla, reconstructive flap surgeries, treating Humeral fractures by open reduction and even while performing incision and drainage of an Axillary abscess. Presence of such variation should always be kept in mind while testing of muscle after administration of neuromuscular block.

a) Embryological Explanation

William Larsen [9] quotes that ventral column motor axons sprout from spinal cord in craniocaudal direction around day 30 in a developingembryo. An apical structure “Growth Cone” is formed at the growing tip of axon. The Growth Cone decides the path to reach the target organ. Filopodia present on Growth Cone grow towards the target organ by sensing molecular markers secreted by surrounding tissue. Location and innervations of the target organ (muscle, joint, skin) is dependent on secretion of certain tropic substances by target organs and its identification by growing axon. Absence of Musculocutaneous nerve in the present case can be explained that growth cone Filopodia of ventral column motor axon sprouting from C5, C6 and C7 spinal segments took an unusual path and travelled from Lateral Cord to form Median nerve via Lateral Root of Median nerve. However the growth cone recognized their target organs correctly and innervated them.

Median nerve had two medial roots because fibres from C8 and T1 spinal segments joint lateral root of median nerve separately.

IV. Conclusion

Roots of brachial plexus seen in root of neck in way to axilla where they form chords. So any surgeries involving axilla and posterior triangle of neck needs utmost care and sufficient knowledge of formation of median nerve and variation in origin of musculocutaneous nerve. Although musculocutaneous nerve found absent in bilateral side of specimen surgeon should need to know about multiple variation of this nerve which have clinical significance in post-traumatic evaluations and exploratory innervations of the arm for peripheral nerve repair. Even though median nerve is main nerve of forearm it supplies arm when absence of musculocutaneous nerve, so it is necessary to gain awareness about such variations before any interventions in treatment of fracture of Humerus and surgeries related to elbow joint.

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Study of Myocardial Bridges in the Hearts of the Human Cadavers

By Dr. Swaroop N., Dr. G. C. Poornima & Dr. Shashanka M. J

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Abstract- *Background:* Myocardial bridging is recognized as an anatomical variation of the human coronary circulation in which an epicardial artery lies in the myocardium for part of its course. Thus, the vessel is 'bridged' by myocardium. The possible clinical implications of myocardial bridging may vary from protection against atherosclerosis to systolic vessel compression and resultant myocardial ischemia.

Materials and Methods: This study was carried out on 50 normal formalin fixed human heart specimens. Dissection was performed according to standard techniques. Percentage and distribution of myocardial bridges and its relationship with coronary artery dominance pattern of the heart were noted and documented.

Results: Myocardial bridges were found in 35 (70%) of the hearts with a total of 46 bridges. Bridges were most often found over the anterior interventricular artery (28 MB), on its middle third (20 MB). Bridges were also found over the diagonal branch (4 MB) and over the left marginal branch (3 MB) branch of the left coronary artery. Out of 11MB found over the right coronary artery, 5 MB was found over the first segment and 6 MB over the posterior interventricular branch of the right coronary artery.

Keywords: *anterior interventricular artery, coronary artery dominance, left coronary artery, myocardial bridges, right coronary artery.*

GJMR-I Classification : *NLMC Code: WG 200, WG 280*

Strictly as per the compliance and regulations of:

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Abstract- Background: Myocardial bridging is recognized as an anatomical variation of the human coronary circulation in which an epicardial artery lies in the myocardium for part of its course. Thus, the vessel is 'bridged' by myocardium. The possible clinical implications of myocardial bridging may vary from protection against atherosclerosis to systolic vessel compression and resultant myocardial ischemia.

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Conclusion: This study will serve to understand the presence and distribution of the myocardial bridges in the heart and its relation with dominance of heart. The possibility of myocardial bridges should be borne in mind in individuals with ischemia but no evidence of coronary atherosclerosis.

Keywords: anterior interventricular artery, coronary artery dominance, left coronary artery, myocardial bridges, right coronary artery.

I. Introduction

Muscle bridge/ myocardial bridge are structures consisting of heart muscle tissue which pass above the coronary arteries and their branches. The first description of myocardial bridge dates from 1737 – Reymann[1], who observed that segments of the left coronary artery can be covered with the thin layer of heart muscle fibre.[2]

The epithelial cells undergo epithelial – to – mesenchymal transition controlled by the factors from the myocardium. The mesenchymal cells thus formed migrate through the spaces generated in the developing myocardium finally forming the coronary arterial system. This migration of these mesenchymal cells through the developing myocardium could explain the embryo-genesis of myocardial bridges over the portions of coronary arteries.[3]

Myocardial bridge has been considered a benign condition, but the following complications have been reported: ischemia and acute coronary syndrome, coronary spasm, ventricular septal rupture, arrhythmias, exercise induced atrioventricular conduction block, stunning, transient ventricular dysfunction, early death after cardiac transplantation and sudden death.The degree of coronary obstruction by a myocardial bridge depends on factors such as location, thickness, length of Muscle Bridge and degree of contractility. The range of myocardial bridge in human cardia when assessed by angiography varies from 1.5% to 16%, but in some autopsy studies it was as high as up to 80%.[4]

Thus in view of its above complication, myocardial bridge should be considered as an anatomical risk factor in evaluating coronary artery disease. There is a wide variation in percentage of heart showing myocardial bridges in every study reported. All these factors made to take up the present study, and perform detailed anatomical study of myocardial bridge in human heart by dissection method.

II. Materials and Methods

The study was carried out on 50 formalin fixed human hearts from patients who had died of non-vascular causes and were autopsied. No gross abnormality of the heart was noted. Study was done without any grouping of specimens on the basis of sex and age. Dissection was performed according to standard autopsy techniques.The right and left coronary arteries were traced by cleaning the epicardium and fat piecemeal using the artery forceps, blunt forceps and mosquito forceps. The origins and course of the two coronary arteries were thus cleared.

The left coronary artery along with its branches was dissected as it passed between the auricle and pulmonary trunk. It was followed to its most distal end. The right coronary artery along with its branches was also dissected and followed to its most distal end. The presenceand location of the myocardial bridges were noted along with the part of the artery and or its branch it was crossing. Specimens showing myocardial bridges

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were photographed from various angles and were numbered.

The data were summarised using descriptive statistics like frequency (number of myocardial bridges), mean, standard deviation, range and 95% confidence interval. All the statistical calculations were performed using software SPSS for windows {Statistical Package for Social Service (SPSS) Inc, 2004, New York} version 13.0.

III. Observations and Results

In the present study the overall prevalence of the myocardial bridging was found to be 70%, Out of total 35 hearts 6(17.14%) showed myocardial bridges on right coronary artery only, 24(68.57%) showed myocardial bridges on the left coronary artery only and 5(14.29%) showed myocardial bridges on both the right and left coronary arteries. Out of 35 hearts having myocardial bridges, 27(77.1%)of hearts were right dominant. 5(14.3%) of these had myocardial bridges over right coronary artery, 19(54.3%) on left coronary artery and 3(8.6%)over both right and left coronary artery.6 hearts were left dominant. One of these had myocardial bridges over right coronary artery, 3(8.6%) over left coronary artery and 2(5.7%) over both right and left coronary artery. The remaining 2(5.7%) hearts were co-dominant and in both myocardial bridges were present on left coronary artery. Even though the percentage of myocardial bridges were more on left coronary artery with right coronary dominance than others, it was not statistically significant(p value 0.5%).

IV. Discussion

Muscle fibres of myocardium overlying coronary artery were first mentioned by Reymann[1] in 1737. They were described as 'myocardial bridges' by Geiringer[5] in 1951. The myocardial bridge is a distinctive anatomical entity whose pathophysiological role has evoked much controversy. Studies have shown that these bands are present from birth and their development is closely associated with the growth of the adjacent artery.

Table 1 : The prevalence of myocardial bridges from different studies

Sl No.	Study	Sample size	Prevalence of myocardial bridges(%)	Comment
AUTOPSY METHOD				
1	Geiringer[5]	100	23	AIV
2	Edwards et al [6]	276	5	All coronaries, 87% in AIV
3	Polacek[7]	70	86	AIV - 60%
4	Giampalmo et al [8]	560	7	All coronaries, 95% in AIV only
5	Lee and Wu [9]	108	58	AIV
6	Ferreira et al[10]	90	56	All coronaries
7	Baptista and Didio[11]	82	54	All coronaries, 35% in AIV
8	Kosinski and Grzybiak[2]	300	31	All coronaries
9	Stankovic and Jesic[12]	23	56	All coronaries
10	Vaishaly K Bharabe et al[3]	50	56	All coronaries
11	**Present study**	**50**	**70**	**All coronaries**
ANGIOGRAPHIC METHOD				
12	Angelini et al[13]	1100	4.5%	All patients
13	Harikrishnan et al[14]	3200	0.6%	All patients
14	AyferMavi et al[15]	7200	0.4%	All patients

The prevalence varies substantially among studies with a much higher rate at autopsy versus angiography. Variation at autopsy may in part be attributable to the care taken at preparation and selection of hearts.Polacek[7], who included myocardial loops, reports the highest rate with bridges or loops in 86% of cases. The present study is 70% which was less than Polacek[7] but more than other studies.

Bridging of coronary arteries in otherwise angiographically normal arteries generally is not hazardous to the patient. However strenuous physical exertion results in compression of a portion of a coronary artery by a myocardial bridge.

Observations were made on the number of myocardial bridges on the hearts in the present study. Geringer[5] 1951 did not observe double and triple myocardial bridges, the analyses of majority of investigators tabulated below and our own observation confirms that these can potentially occur either over one or more coronary arteries.

Table 2 Comparison of number of myocardial bridges in the hearts with other studies

Sl No.	Studies	No. of hearts studied	No. of hearts with MB(%)	Total no. of bridges	Hearts with MB		
					Single	Double	Triple
1	Present study	50	35(70%)	46	25(50%)	9(18%)	1(2%)
2	Ferreira AG et al[10]	90	50(55.6%)	70	35(38.9%)	10(11.1%)	5(5.5%)
3	Kosinski A et al[2]	300	94(33.3%)	114	75(24.9%)	18(5.9%)	1(0.3%)
4	Loukas M et al[16]	200	69(34.5%)	81	59(29.5%)	8(4%)	2(1%)
5	Stankovic I [12]	23	13(57%)	18	9(39.4%)	3(13.1%)	1(4.3%)

All the studies tabulated above showed the single MB in majority of cases followed by double and triple MB. But the percentages of MB are high in the present study when compared with others.

In the light of previous studies by Ferreira AG[10] 1991, Vanildo Junior de Melo Lima[17] 2002, Kosinski A[2] 2004, AyferMavi et al[15] 2008, Vaishaly K B et al[3]2008,MB are most often associated with the left coronary artery on AIV, mainly the middle 1/3rdof this. These results are consistent with our observation.The searching for the nature of this co- existence should probably focus on analysis of the processes connected with the development of the coronary vessels during foetal life. The formation of superficial arterial system begins between 5 and 6 weeks after fertilization and before the development of the myocardium has been arising. The earlier development of the artery leads to a completed. It is likely that the coincidence of these processes is a prerequisite for a myocardial bridge geater probability of some fibres of the myocardium forming a myocardial bridge over it. Initially arteries occur in grooves along the places with maximum concentration of connective tissue. The AIV stands apart as the first and MB are observed most frequently over this artery.

Observations were made on the distribution of hearts having MB on main coronary arteries in relation to the coronary arterial dominance pattern of heart. We found MB were distributed more over LCA in right coronary dominant hearts which is similar with the results of Vaishaly K B[3] 2008. Whereas the study done by Loukas[16] 2006 showed that MB were distributed more over LCA in left dominant hearts.

Table 3 : Comparison of relationship of myocardial bridges over dominance of heart

Studies	No. of hearts with MB(%)	Myocardial Bridges								
		Right dominant hearts			Left dominant hearts			Co-dominant hearts		
		LCA	RCA	Both LCA & RCA	LCA	RCA	Both LCA & RCA	LCA	RCA	Both LCA & RCA
Present study	35 (70%)	19 (38%)	5 (10%)	3 (6%)	3 (6%)	1 (2%)	2 (4%)	2 (4%)	-	-
Vaishaly K B[3]	30 (60%)	20 (40%)	3 (6%)	-	3 (6%)	-	-	3 (6%)	1 (2%)	-
Loukas[16]	69 (35%)	6 (3%)	11 (6%)	-	42 (21%)	4 (2%)	-	4 (2%)	2 (1%)	-

V. Conclusion

Myocardial bridges are still an open issue. The discussion whether it is a variation of physiology is still on going. In most of the individuals they do not cause symptoms but particularly in those with long and deep myocardial bridges, the anatomical relation of the myocardial fibres can distort the artery that can be identified angiographically. The possibility of bridges should be borne in mind in individuals with ischemia but no evidence of coronary atherosclerosis.

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Off-Pump Coronary Artery-Bypass Grafting (OPCAB) at Sudan Heart Institute : Is it A Safe Operation for Coronary Revascularization in Sudan?

By Leena E Elmokashfee & Nezar B Elhassan

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Abstract- *Background:* The incidence of coronary artery disease (CAD) is rising in Sudan as well as in Africa and all over the world, with increasing need for myocardial revascularization. This study is an attempt to highlight the safety of practicing off- pump coronary artery bypass grafting as a primary option for surgical myocardial revascularization, as the use of cardiopulmonary bypass machine was found to be associated with many cardiovascular and systemic complications. Lacking local information regarding this operation dedicated the need to structure such a research in order to be a basis for further studies.

Objective: To assess the preoperative characteristics and outcome of patients undergoing off-pump coronary artery bypass surgery.

Method: This is a combined retro-prospective descriptive consecutive case series study conducted at Sudan Heart Institute (SHI) and included all the patients with CAD; who were candidates for CABG; presented in the period between Aug/2011 to Aug/2013

Keywords: *CABG, OPCAB, SHI, sudan.*

GJMR-I Classification : *NLMC Code: WG 300, WG 595*

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(A Single Surgeon's Experience)

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Method: This is a combined retro-prospective descriptive consecutive case series study conducted at Sudan Heart Institute (SHI) and included all the patients with CAD; who were candidates for CABG; presented in the period between Aug/2011 to Aug/2013

Results: 91 patients were included in this study. Females (30.8%) were less affected compared to males and the most affected age group was 41-69 years. 63.7% had HTN, 52.7% had DM. The majority (76.9%) presented with angina CCS class III or VI. Significant LM coronary artery disease was detected in 38 (41.8%). None of the patients had post operative MI. 10 (11.0%) patients developed atrial fibrillation. 56 (61.5%) were extubated within the first 6 hours and 61 (67%) needed primary ICU care for one or 2 days. One death (1.1%) was reported during 30 days- postoperative follow up.

Conclusion: Off-pump coronary artery bypass grafting could be conducted safely in SHI with reasonable outcome compared to the international data.

Keywords: CABG, OPCAB, SHI, sudan.

I. Introduction

Beating-heart surgery is not a revolutionary new approach. It was well recognized main surgical technique for CABG before the advent of cardio-pulmonary bypass (CPB) (1,2).While CABG on a beating heart was developing, Gibbon performed his first successful application of cardiopulmonary bypass (CPB) in human in 1953(3) diverting the surgeons' interest towards this procedure as it enables operating comfortably in an asystolic heart. However with the develop-ment of anaethesia and proper monitoring of the patients, the deleterious effect of CBP rose in the horizon and rang a bell to revolutionize the previous era of operating on a beating heart. Thus, Buffolo et al and Benneti et al published their retrospective series concluding that," OPCAB could be performed safely with results similar to the conventional CABG" (4, 5). Many studies showed the benefit of OPCAB compared with conventional CABG especially in elderly, high risk patients and those with concomitant Comorbidities (6-9).

Although conventional CABG is still the essential operation at most of the cardiac centres in Sudan, OPCAB became the major operation for myocardial revascularization in SHI, started since 2007.

Aim of this study: to reflect SHI experience in OPCAB during the 2-year interval specified by this study and to highlight the preoperative features, operative procedure, outcome, feasibility and safety of this operation in our settings.

II. Patients and Methods

A combined retro-prospective descriptive case series study was designed to include all the patients with CAD presented to our unit at Sudan Heart Institute (Mr. Nezar's cardiac surgery unit) and scheduled for isolated surgical myocardial revascul-arization in the time interval between Aug/2011 and Aug/2013. There were not any exclusion criteria.

The total number of patients was 94 with average of 47 pt per year. Approximately all patients' criteria, clinical presentation and investigations including their coronary angiograms were discussed in the weekly conjoint cardiology/cardiac surgery meeting. All patients were operated on by one staff; led by a single surgeon with experience in CABG with and without

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cardiopulmonary bypass. They were followed up for 30 days post operatively.

The collected data was entered in a master sheet of IBM SPSS program version 20. Then computerized analysis was run. Frequencies, percentages, means ± SD, median and ranges were calculated. Cross tabulation and Chi square test were also performed with statistically significant difference between the variables when P value was less than 0.005.

III. The Operative Procedure

a) Anaesthesia

All patients were anaesthetized according to the standard clinical routine of the department. The patients were artificially ventilated during the procedure, while maintaining MAP over 60 mmHg. Noradrenaline, adrenaline and GTN were given as intermittent injections via syringe pumps to compensate for fluctuation in blood pressure. Beta blockers were used to induce a controlled bradycardia and facilitate distal anastomosis on the beating heart.

During lifting of the heart to graft the branches of the CX artery or the posterior branches, Mean BP was maintained by flooding the patients with IV fluids, extreme Trendlenberg position and inotropic manip-ulation. The patients were not extubated immediately at the end of the opertation, but they were lightly sedated in the ICU till they regain normal physiological parameters and extubated thereafter.

b) Surgical procedure

The patients were operated through a standard median sternotomy. Initial heparinization was achieved with 5000 IU of low molecular weight heparin. The conduits; Left Internal Mammary Artery (LIMA) and great saphenous vein; were harvested. Then, heparin 150 IU/kg was given to keep the ACT above 300 seconds throughout the anastomoses and it was reversed at the completion of the last proximal anastomosis using protamine sulfate in 1:1 ratio. Only the left pleura needed to be opened. intra-aortic balloon pump (IABP) was neither used preoperatively nor intraoperatively.

CTS stabilizer and Octopus 2 (Medtronic Inc) were used and distal anastomoses were achieved using continuous 7-0 polypropylene sutures over intracoronary shunts. A side- biting clamp was applied to the ascending aorta to perform the proximal anastomoses using continuous 6-0 polypropylene suture. All patients were transferred to the Cardiac Intensive Care Unit (CICU) without or with minimal inotropic support.

IV. Results

During 2 year- interval (from Aug/2011 to Aug/2013), there were 94 patients with CAD presented at our unit. All of them were candidates for CABG alone without associated any other cardiac procedure and none of them had a previous cardiac surgery. Initially, 3 patients were excluded from the study as part of their data was lost. OPCAB was the primary operative choice and the average number was 47 patients per year.

a) Preoperative characteristic

as summarized in table (1) showed: 63(69.2%) patients were males, while females represented 28 (30.8%) of them. The mean age at presentation was (60.43 ± 1.03) years. The most affected age group was (41-69) years; in which 71 (78%) of the pts were clustering.

b) Patients having co-morbidities were

58 (63.7%) with hypertension, 38 (41.8%) had hypercholesterolemia and 48 (52.7%) with DM; 22 (24.2%) of them were insulin dependent. 44 (48.4%) were either current or former smokers. 70 (76.9%) patients presented with CCS class III/ IV and 18 (19.8%) with NYHA class III/IV.

c) Angiograhic data

showed 57 (62.6%) had good left ventricular function with EF > 50% and 1(1.1%) had poor LVEF < 30%.Those who had significant LM coronary artery disease were 38 (41.8%). There were 14(15.4%) patients with single vessel disease, 16(17.6%) had double vessel disease and 23(25.3%) had triple vessel disease. Previous non surgical coronary intervention in form of PTCA ± stent was done in 11 (12.1%) pts; 10 (90.9%) had instent restenosis, while the procedure failed in 1 pt (9.1%).

Table 1 : Preoperative Patient Characteristics

Variable	N (%)
Total patients	91 (100)
Sex	
Male	63(69.2)
Female	28 (30.8)
Age (Years)	
Mean **± SD**	60.43 ± 1.03
Range	30- 77
HTN	58 (63.7)
Diabetes mellitus ID	22 (24.2)
Diabetes mellitus NID	26 (28.6)
Hypercholesterolemia	38 (41.8)
Smoking	44 (48.4)
CCS class	
I & II	21(23.1)
III & IV	70 (76.9)
NYHA class	
I & II	73 (80.2)
III & IV	18 (19.8)
EF	
>50%	57 (62.6)
30 – 50%	33 (36.3)
< 30%	1 (1.1)
LM	38 (41.8)
PCI	11 (12.1)

HTN=hypertension, CCS=Canadian Cardiov-ascular Society classifications of functional limitation related to angina, NYHA=New York Heart Association Functional Classification in a Patient with Heart Disease, ID= insulin depe-ndent, NID= Non-insulin dependent, EF=Left Ventricular Ejection Fraction, LM= Left main stem disease, PCI=Percutaneous coronary intervention

d) The operative features

regarding the priority of care; 75 (82.4%) of the patients were scheduled for elective operation, while 16 (17.6%) needed urgent surgical intervention. Emergency OPCAB was not performed during the period of the study.

139 bypass grafts were performed with average number of 1.5 grafts per patient. The total number of distal coronary anastomoses was 1 in 47(51.6%), 2 in 40 (44.0%) and 3 in 4 (4.4%) patients. Pedicle LIMA was used as a vascular conduit in 90 (98.9%) patients, while LIMA & SVG together were used in 44 (48.4%) patients. The most frequently grafted vessel was LAD in 90 (98.8%) patients.

LAD was found to be diffusely diseased in 1 (1.1%) patient; so its first diagonal branch was grafted instead. There was no reported conversion to conventional CABG.

e) Operative time

ranged from 2 to 6 hours. A chi-square test was performed and a statistically significant difference between number of grafts and the operative time was found, $X2$ (4, N = 91) = 74.82, $p< 0.001$.

f) Post operatively

as showed in table(2): total blood loss of 0.5L or less was recorded in 38 (41.8 %) patients, while the average blood loss was (878 ml ± 0.05). 44 (48.4) needed blood transfusion, however 35 (38.5%) received only 1 or 2 units of blood and none of them needed blood transfusion of more than 5 units.

None of the patients developed post operative MI. 10 (11.0%) patients developed atrial fibrillation; transient in 8 (72.7%) and intermittent in 2 (18.2%). 3 (3.3%) patients had VT that reversed back to sinus rhythm after DC shock.

g) Regarding the systemic complications

none of the patient developed stroke, but there were 3(3.3%) with acute confusion state recovering during the first postoperative days. 1 (1.1%) had renal failure requiring dialysis.

56 (61.5%) were extubated within the first 6 hours following surgery and 7 (7.7%) were extubated after more than 12 hours.

Only one patient needed primary ICU care more than 5 days. 82 (90.1%) were discharged from hospital within 7 days of their surgery and 2 (2.2%) needed to stay for more than 10 days.

There was no hospital mortality in the initial admission for surgery. One death (1.1%) was reported during 30 days- postoperative follow up.

Table 4 : Postoperative features

Variable	N (%)
Mean total blood loss (ml) ± SD	878 ± 0.05
Transfusion	44 (48.4)
Reoperation for bleeding	1 (1.1)
Pleural effusion requiring puncture	3 (3.3)
Myocardial infarction	0 (0.0)
Atrial fibrilation	10 (11.0)
Stroke	0 (0.0)
Acute confusion state	3 (3.3)
Sternotomy infection **Superficial** **With sternum dehiscence**	9 (9.9) 5 (5.5) 4 (4.4)
Renal failure requiring dialysis	1 (1.1)
Extubation within first 6 hours	56 (61.5)
ICU length of stay (days) **Mean ± SD** **Range**	 2.5 ± 0.10 1- 7
Hospital length of stay (days) **Mean** **range**	 5.7 3- 36
Initial hospital mortality	0 (0.0)
30 days mortality	1 (1.1)

V. Discussion

The annual incidence of CAD in Sudan; as estimated in 1989; reached 112/100 000 with a total mortality of 36/100 000(10). However, according to the latest WHO data published in April 2011, the mortality rate reached 212.02/100,000(11). Coronary Artery Bypass Grafting (CABG) becomes the current surgical benchmark for coronary revascularization. Despite being conducted irregularly, conventional CABG is the main operation performed in Sudan except in SHI, where we adopted OPCAB as the routine operation for myocardial revascularization. This study reflected that; the initial total number of patients undergoing OPCAB was 94 with average around 47 per year and this is more than the number of operations done at the same centre in 2007 and 2008; which were 7 and 14 respectively; when most of the operations done were conventional CABG (12). Thus, CABG in this centre is moving quickly and efficiently towards being predominantly done without CPB. The regular cardiac operation and follow up

systems in our centre dedicate a continuous improvement in the surgical process

30.8% of the study population were Females; which indicated a genuine gender difference in the pattern of affection with CAD that necessitates surgical intervention .This finding was consolidated by other studies (13- 17) .We had 4 young patients less than 40 years with equal incidence between males and females. More patients having DM were reported in our study with a percentage of 52.7 (13, 14) ; this needs further elaboration as DM may explain the nature of diffusely diseased vessels encountered during the research period and the late presentation reflected by the functional class CCS III/IV and NYHA class III/IV.

There were 16 (17.6%) patients requiring urgent operation and their outcome didn't differ from those done electively. Intra-coronary shunts were used routinely as their use during OPCAB has been shown to preclude left ventricular dysfunction (18). IABP was not used in our patients and we reported 1(1.1%) patient having poor LVEF < 30% but he had smooth operative and post operative course, so the poor left ventricular function was not regarded as exclusion criteria in our study in contrast to the Beating Heart against Cardioplegic Arrest Study-1 (BHACAS-1)(15).Those patients with severe left ventricular dysfunction can benefit a lot from OPCAB as been stated by Tugtekin and associates (19).

Those who had LM coronary artery disease were 38 (41.8%) which was far more than those in other studies; Salah'study (8.33%) and Gwozdziewicz et al (24.2%) (13, 14).139 bypass grafts were performed with average number of 1.53± 0.06 grafts per patient which was less than those mentioned in the literature; more than 2 grafts per patient in both pro-spective and retrospective studies; and this may be explained by the diffusely diseased small non graftable coronary arteries (20, 21). The diffusely diseased coronary vessels are also seen in the south East-Asian population, and more so in patients with Indian origin (22). Pedicle LIMA alone was used as a vascular conduit in all patients except one as it was damaged accidently by the harvesting trainee. Radial artery and RIMA were not used. 10 (11.0%) patients developed atrial fibrillation representing 0.5 or less of those reported in a number of randomized controlled trials and reflecting less incidence of developing atrial fibrillation in our patients(23- 27).

Only one patient stayed for more than 5 days in the CICU: he was a heavy smoker with a huge mediastinal cyst, which was excised and biopsy revealed a simple thymic cyst. 82 (90.1%) were discharged from hospital within 7 days of their surgery. The short in-hospital stay in OPCAB patients reduces greatly the burden on the hospital as been concluded in three large meta-analysis studies (28- 30).

One death (1.1%) was reported during 30 day-postoperative follow up as the patient developed severe pneumonia with sepsis and MODS. He was the only pt needed renal replacement therapy in our study.

VI. Conclusion

OPCAB, when compared with conventional CABG, is associated with at least equivalent clinical outcome at lower cost. However, benefits of OPCAB were well documented in reducing mortality and morbidity. It is associated with fewer incidences of chest infection, inotropic requirement, arrhythmias, total chest tube drainage and consequent transfusion requirement, intubation time, intensive care, and hospital stay. It reduces myocardial, renal, neurocognitive and gastro intestinal complications (31-34).

This study proved that, performing Off-pump coronary artery bypass grafting (OPCAB) in our setting is a safe procedure, and its pioneer application at Sudan Heart Institute met the international outcome. We have to go a step further in designing other studies including mid-term and long-term follow up, together with assessment of graft patency. The obstacles facing OPCAB in Sudan are the scarcity of the professional personnel and the steep learning curve for mastering this operation with capability of converting into conventional CABG when being necessary.

VII. Abbreviations

CAD: Coronary artery disease
CABG: Coronary artery bypass grafting
CBP: Cardiopulmonary bypass machine
CABG: coronary artery bypass grafting
OPCAB: Off –pump coronary artery bypass grafting
SHI: Sudan Heart Institute
MODS: Multi- organ dysfunction

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Use of Intravenous Clonidine for Prolonging Spinal Anaesthesia

By Dr. Prerana N. Shah & Dr. Devanand Pawar

Abstract- Use of intravenous clonidine for prolonging spinal anaesthesia with bupivacaine.

Background: Several additives like clonidine are added to prolong spinal blockade. We considered using clonidine through intravenous route as it achieves peak plasma concentration more rapidly than oral or intrathecal routes. The aim was to study onset of analgesia and duration of sensory and motor blockade after spinal anaesthesia.

Methods: Our study was a double blind prospective randomized controlled type of 100 patients. In clonidine group, intravenous 3 mcg/ kg of Clonidine diluted in 10ml of normal saline was administered after making the patient supine following the spinal blockade. In saline group, intravenous 10 ml of normal saline was administered. Patients were monitored until the sensory block regressed below L1 dermatome and knee flexion had recovered. Heart rate and mean arterial pressure were measured.

Keywords: *anaesthesia, spinal, bupivacaine, clonidine*

GJMR-I Classification : *NLMC Code: WL 500*

Strictly as per the compliance and regulations of:

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Dr. Prerana N. Shah [α] & Dr. Devanand Pawar [σ]

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Results: The mean duration of sensory blockade in clonidine group and saline groups were 206.20 and 136.20 minutes respectively. The motor blockade in clonidine group lasted for 157.60 and 129.60 minutes in saline group. The highest spinal level achieved was between T4 to T8 level and between T2 to T8 in clonidine and saline groups respectively. The incidence of bradycardia and hypotension was comparable.

Conclusion: Intravenous clonidine significantly prolonged the duration of spinal blockade.

Keywords: anaesthesia, spinal, bupivacaine, clonidine

I. Introduction

Several additives like clonidine are added to prolong spinal blockade. Many trials have shown that by using various additives intrathecally the duration of spinal anaesthesia can be increased. Previous studies have demonstrated that by adding small dose of vasoconstrictors intrathecally with anaesthetic agent, sensory block may be prolonged[1, 2].

Clonidine is a selective 2 adrenergic receptor agonist, which is known to produce sedation, analgesia and haemodynamic stability. It is also known that clonidine prolongs spinal anesthesia when added to intrathecal local anesthetic agents or when administered as an oral medication[3-5]. However, it is not clear whether the effect of clonidine is mediated locally at the level of the spinal cord or whether the effect is mediated systemically. In order to test the hypothesis that the effect might be mediated systemically rather than locally, the study was designed. Previous studies have used oral clonidine. However, it is likely that IV clonidine will achieve higher plasma concentrations and more rapidly than oral clonidine and intrathecal injection may or may not have the same effects.

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II. Materials and Methods

The approval of the double blind randomized study was provided by the Institutional Ethics Committee. Written informed consent was taken for all the cases. The aim was to study onset of analgesia, duration of sensory and motor block after spinal blockade. In addition, the hemodynamic effects after giving intravenous clonidine were also noted. Previous study by Rhee et al[6] showed duration of sensory block of 196 ± 42 minutes in clonidine group versus placebo having duration of sensory block of 125 ± 25 minutes. The duration of motor block in clonidine group versus placebo was 153 ± 26 minutes versus 131 ± 29 minutes respectively. For alpha error of 0.05 and power of study to be 80%, expected sample size was 88. Considering dropout etc, the study was done in 100 patients. We had a set of computer generated 50 exclusive random numbers for each group. They were then chronologically numbered and were allotted the group depending on the group they belonged as per randomization. Thus, the allocation was random and 50 cases were selected for each group. The study drug solutions were not made by the anaesthesiologist evaluating the patient and were not aware of the group to which the patient belonged. This study was planned for a period of about six months.

In group C, 3 mcg/ kg of Clonidine diluted in 10ml of normal saline was administered intravenously for a period of 10 minutes immediately after laying down the patient in supine position following the spinal blockade with 15 mg (3 ml) of 0.5% hyperbaric bupivacaine. In group S, only 10 ml of normal saline was administered intravenously over a period of 10 minutes after patient was placed supine. Patient belonging to ASA grade I and II, with age between 20 to 65 years with height between 150 – 180 cm undergoing inguinal surgery under spinal anaesthesia were included. As height influences the dosage of drug in spinal anaesthesia, for a constant dosage, height range of

patients in 150-180 cm was chosen. Patients known to have allergy to clonidine and bupivacaine and pregnant and lactating women were excluded from the study. Preoperative pulse and blood pressure were recorded. All patients were preloaded with 500 ml of lactated Ringer's solution. Onset of analgesia was assessed by pinprick until highest level of sensory blockade was achieved and thereafter every 10 minutes during surgery. Duration of sensory block was defined as duration between injection of spinal anaesthetic agent to regression of spinal level up to L1 dermatome, while duration of motor block was defined as duration between injection of intrathecal drug and recovery of knee flexion and ability to move the posterior aspect of knee 10 cm above the surface of bed. Heart rate and mean arterial pressure (1/3 Systolic Blood Pressure + 2/3 Diastolic Blood Pressure) were measured and recorded every two minutes for first 10 minutes, during surgery. The lowest heart rate and blood pressure was also noted. Bradycardia (heart rate less than 45 beats per minute) (bpm) and hypotension (mean blood pressure less than 70% of base line) were treated appropriately. Patients were observed until the sensory block regressed below L1 dermatome and knee flexion had recovered. This was the end point of study.

III. Statistical Analysis

Demographic data was analyzed by Pearson's chi-square test. Duration of spinal anaesthesia, mean heart rate and blood pressure and the occurrence of cardiovascular side effects if any between the two groups was analyzed using unpaired 't' test. 'p' value less than 0.05 was considered significant.

IV. Results

As estimated, the study was completed in six months. All 100 patients who were enrolled completed the study.

As seen in Table 1, the patients were comparable in both groups with respect to demographic data. As depicted in table 2, mean pre-operative and lowest intra-operative pulse rate between the groups was comparable. As seen in table 3, the difference in pre-operative and intra-operative lowest mean arterial pressure (MAP) in between two groups was not statistically significant. Table 4 depicts that two patients in group C developed hypotension, which was comparable to incidence of hypotension in group S where only one (2%) patient developed hypotension. In group C, only two (4%) patients had developed bradycardia and only one (2%) patient in group S had presence of bradycardia. The incidence of bradycardia in two groups was comparable.

As shown in table 5, the highest spinal level achieved was between T4 to T8 level in group C and the median highest spinal level achieved was T6 that was present in 25 (50% in a group) patients. In group S 30 (60% in a group), patients achieved highest level of T6. The difference between two groups was statistically not significant.

The difference of mean duration of sensory and motor blockade between two groups was highly significant as evident in table 6.

V. Discussion

Small dose of vasoconstrictors intrathecally the duration of sensory block can be prolonged[7]. Clonidine is a selective 2 adrenergic receptor agonist, which is known to produce sedation, analgesia and hemodynamic stability. It is also known that clonidine prolongs spinal anesthesia when added to intrathecal local anesthetic agents or when taken orally.

By considering this in mind, intravenous clonidine would reach peak plasma concentration more rapidly than oral clonidine and it may have the same effect even if administered after intrathecal injection of local anaesthetic agents.

K. Rhee et al, performed a similar study in 78 patients The demographical data was comparable as in our study.[6] Victor Whizar-Lugo et al did a study for comparing dexmedetomidine and clonidine for prolonging spinal anaesthesia[8]. The demographical data of this study was comparable to our present study. In the study by I. Van Tuijl et al healthy women (ASA I or II) presenting for an elective Caesarean section with 150–195 cm height and 50–120 kg weight were studied.[9] Intravenous administration of 2 adrenoceptor agonists frequently leads to an initial increase in arterial blood pressure and systemic vascular resistance and a secondary decrease in heart rate resulting in transient reduction in cardiac output[9]. These effects are probably due to activation of alpha 1 receptors and post-junctional vascular alpha-2 adrenoceptors. This first short period of increase in blood pressure is within minute followed by a longer period characterized by a decrease in heart rate and arterial blood pressure due to centrally mediated decrease in sympathetic action[10, 11]. The reduction in sympathetic tone results in a reduction of heart rate, systemic metabolism, myocardial contractility and systemic vascular resistance. The result of these effects is a net decrease in myocardial oxygen consumption, which most probably explains the positive effects seen with alpha 2 adrenoceptor agonists in the treatment of angina pectoris.

Clonidine attenuates cardiovascular reactions and provides circulatory stability by its action at central alpha2-adrenergic receptors. However, intravenous clonidine especially when infused rapidly and at high plasma concentrations, may result in vasoconstriction and increased arterial blood pressure by peripheral alpha 2 adrenergic stimulation. In this study, 3 mcg/kg of clonidine mixed in 10 ml of normal saline was administered intravenously for 10 minutes to avoid stimulation of peripheral alpha 2 adrenergic receptors.

K. Rhee et al showed comparable pre-operative pulse rate and intra-operative lowest pulse rate[6]. Study by Victor Whizar-Lugo et al showed similar results.[8] Liu et al used oral clonidine for prolongation of lidocaine spinal anesthesia in human volunteers and found no significant change in pulse rate.[12] Stephan Strebel et al performed a study using various doses of intrathecal clonidine for prolongation of spinal anaesthesia in orthopedic surgeries and found no significant change in haemodynamic parameter after using clonidine up to 150 mcg/kg dose.[13] However, study done by L. Niemi using 3 mcg/kg intrathecal clonidine on effects of duration of bupivacaine spinal anaesthesia showed mean arterial pressure and heart rate significantly lower in the clonidine group compared to the control group.[4]

In our study, pre-operative mean blood pressure was comparable. The incidence of hypotension in the study done by Victor Whizar-Lugo et al for comparing intravenous dexmedetomidine and intravenous clonidine for prolonging spinal anaesthesia was similar to our present study.[8] In study by Liu et al on use of oral clonidine to prolong lidocaine spinal anesthesia in human volunteers, no significant decrease in blood pressure in clonidine and control group was found.[4]

In one another study Stephen Mannion et al used Intravenous Clonidine for prolonging postoperative analgesia after psoas compartment block for hip fracture surgery and also showed no significant decrease in blood pressure.[14]

In a study done by L. Niemi on effects of intrathecal clonidine on duration of bupivacaine spinal anaesthesia in patients undergoing knee arthroscopy found there was significant increase in incidence of hypotension and bradycardia with use of clonidine 3 mcg/ kg.[4]

Descending noradrenergic antinociceptive pathways originating in the brainstem are believed to be associated with analgesic effects by suppression of spinal nociceptive impulses. Alpha 2a adrenoceptors have been identified in substantia gelatinosa of the dorsal horn of the spinal cord. Stimulation of these alpha 2a adrenoceptors inhibits the firing of nociceptive neurons stimulated by Aδ and C fibers and is considered to be one of the main mechanisms of descending endogenous pain modulation[15].

Recent evidence suggests that the antinociception produced by alpha 2a adrenoceptor agonists may be due in part to acetylcholine release in the spinal cord. Since the spinal cord is the major site of analgesic action of alpha 2a adrenoceptor agonists, the epidural and intrathecal routes have been considered preferable to the intravenous route. This is, however, questioned by data showing a similar effect of orally administered clonidine when compared to intrathecally applied clonidine in the context of spinal anaesthesia[16]. Also due to its lipid solubility clonidine will readily penetrate extra vascular sites as well as central nervous system and can cause same effect as does by intrathecal clonidine

In our study, median highest spinal level in clonidine group was T6 that was present in 25 patients of total 50. In saline group, total 30 patients achieved highest level of T6 in out of 50 patients. The difference between two groups was not statistically significant.

In similar study done by K. Rhee et al, the median highest level of spinal blockade was T5 in both clonidine and control group. The highest spinal level achieved in this study was comparable to our present study.[6]

The motor blockade in clonidine and saline group lasted for 157.60 and 129.60 minutes respectively, while the duration of sensory blockade was 206.20 and 136.20 minutes The difference of mean duration of sensory and motor blockade between two groups was statistically significant.

In study by K. Rhee et al, the duration of sensory and motor blockade was prolonged approximately by one hour and 25 minutes respectively. This prolongation in duration of spinal blockade was comparable to our study. The difference in prolongation of duration of spinal blockade between two groups was statistically significant.[6]

Victor Whizar-Lugo et al have done a study for comparing intravenous dexmedetomidine and intravenous clonidine for prolonging spinal anaesthesia against placebo group. They found significant increase in duration of sensory and motor spinal blockade with using intravenous clonidine 4 mcg/kg. The prolongation in duration of sensory blockade was approximately one hour and motor blockade was approximately 20 minutes with clonidine.[8] In another study done by L. Niemi on effects of intrathecal clonidine on duration of bupivacaine spinal anaesthesia and also found there was significant increase in duration of spinal anaesthesia with use of clonidine 3 mcg/ kg.[4]

VI. Conclusion

Administration of intravenous clonidine in patients undergoing spinal anaesthesia using 0.5 % Bupivacaine, significantly prolonged the duration of spinal anaesthesia without significant increase in incidence of haemodynamic side effects like hypotension and bradycardia.

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Table 1 : Demographical data

Parameters	Group C	Group S
American Society of Anaesthesiologists Grade (ASA) status I (number)	35	38
ASA status II (number)	15	12
Male (number)	39	34
Female (number)	11	16
Age (yrs) Mean ± SD	37.58 ± 12.609	38.70 ± 12.968
Weight (kg) Mean ± SD	61.86 ± 7.49	60.88 ± 8.573
Height (cm) Mean ± SD	165.20 ± 6.719	162.52 ± 9.811

Table 2 : Pulse rate (beats per minute)

Pulse rate (beats per minute)	Group C	Group S	P value
Preoperative	86.16 ±8.775	84.94 ±9.483	0.506
Intraoperative Lowest	60.98 ±8.959	60.06 ±9.142	0.612

Comparable

Table 3 : Mean arterial pressure (mm Hg)

Pulse rate	Group C	Group S	P value
Preoperative	99.14 ±5.792	99.20 ±5.379	0.957
Intraoperative Lowest	75.74 ±8.773	74.74 ±5.900	0.505

Comparable

Table 4 : Incidence of haemodynamic side effects

Side Effect (No of patients)	Group C	Group S	Total
Hypotension	2	1	3
Bradycardia	2	1	3

Table 5 : Highest spinal level

Level (No of patients)	Group C	Group S	Total
T2	0	1	1
T4	13	9	22
T6	25	30	55
T8	12	10	22

Table 6 : Duration of spinal blockade

	Group C	Group S		P value
Sensory blockade (minutes)	206.20 ± 19.155	136.20 ±	15.104	0.000
Motor blockade (minutes)	157.60 ± 14.365	129.60 ±	14.422	0.000

Significant

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Surgical Anatomy of Coeliac Trunk Variations an Autopsy Series of 40 Dissections

By Dr. S. Saritha
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Abstract- In modern surgical, radiological and transplantation procedures an anatomic vascular variations is of greater importance. The coeliac axis arterial patterns are of importance in planning all surgical performances mainly liver transplantation and radiological procedures in the upper abdomen. This is to avoid surgical mistakes which may lead to serious consequences to the patient and also medico legal implications.

The celiac orcoeliacartery, is also known as the coeliac trunk (coeliac axis), or truncus coeliakus. It is the first major branch of the abdominal aorta The coeliac artery supplies oxygenated bloodto the liver stomach abdominalesophagus spleenand the superior half of both the duodenum and the pancreas. These structures are derived from the embryonic foregut. The coeliac artery is an essential source of blood, since the interconnections with the other major arteries of the gut are not sufficient to sustain adequate perfusion.

Keywords: coeliac trunk (CT), commonhepatic artery (CHA), left gastric artery (LGA); splenic artery (SA), superior mesenteric artery (SMA), inferior phrenic artery (IPA), variation, surgical and radiological procedures.

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The variations in the coeliac axis and its branches were observed frequently during the routine dissections of the abdomen when teaching the undergraduate students. The current study involves 40 cadavers (34 males and 6 females) in a period of 3 years and we observed anomalies of coeliac axis in 4 male cadavers. The purpose of this study was to evaluate these variationswith respect to their impact on visceral surgery and also to determine the comprehensive spectrum in the variations of prevalence of coeliac axis.Therefore a thorough knowledge of variation of coeliac trunk is important for proper pre-operative diagnosis and planning of surgical and radiological interventions. Presence of arterial variations may result in erroneous interpretation of angiograms

Keywords: coeliac trunk (CT), commonhepatic artery (CHA), left gastric artery (LGA); splenic artery (SA), superior mesenteric artery (SMA), inferior phrenic artery (IPA), variation, surgical and radiological procedures.

I. Introduction

The coeliac trunk is the first ventral branch of the abdominal aorta and it supplies the supracolic organsThe Coeliac trunk arises at the level of T12/L1 vertebral bodies just below the Aortic hiatus. It is 1.5-2 cms long and passes almost horizontally forwards and slightly to the right above the pancreas.(1).

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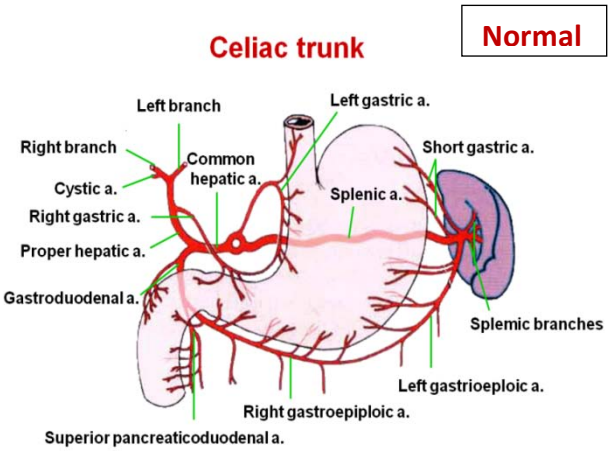
According to standard anatomical textbook descriptions, the coeliac trunk and its branches supplies the gastrointestinal tract from the lower 1/3rd of the esophagus to middle of 2nd part of the duodenum and all derived adenexae (liver, biliary tree, spleen, pancreas, greater and lesser omentum).

When there is one vascular variation, there is a high chance of multiple variations. The arterial architecture is important in a patient undergoing surgery in this area or it may lead to a risk of an error in committing lethal complications.Variations of these arteries and their relationship to the surrounding structures are of particular importance from a surgical perspective.Incidence and variation in the branches of the CT requires specialized preoperative diagnostic knowledge.

An anatomical variation of the coeliac trunk and hepatic arteries hasconsiderable importance in liver transplants, hepatobilary manipulations, laparoscopic abdominal surgery, radiological abdominal interventions and penetrating injuries to the abdomen. The aim of the present study was to highlight the additional branches arising from the CT and discuss their topography, which may be important for surgeons operating in upper abdominal regions.Presence of additional arteries may provide collateral circulation which is essential during transplant surgeries. We looked at these vascular systems in routine cadavericdissections. .

II. Materials and Methods and Observations

The branching patterns of the Coeliac trunk was done on 40 embalmed cadavers (34 males and6 females) which were used during routine dissection by undergraduate I MBBS students from the Department of Anatomy for a period of 3 years .The abdomen region was dissected out carefully for Coeliac trunk and their branches by retracting the stomach and the small intestine. Each and every branch was traced from the origin to the termination. Specimens with topographical derangements were excluded from the study. **The variations in the branching pattern of the coeliac artery were observed in fourmale cadavers and the rest of the cadavers showed the normal branching pattern.**



III. Results

In the present study the trifurcation of the coeliac trunk into usual three branches, the LGA, the CHA, and the SA was observed in all the cadavers **except** four.

The clinically relevant variations of the coeliac trunk in those four male cadavers were as follows:

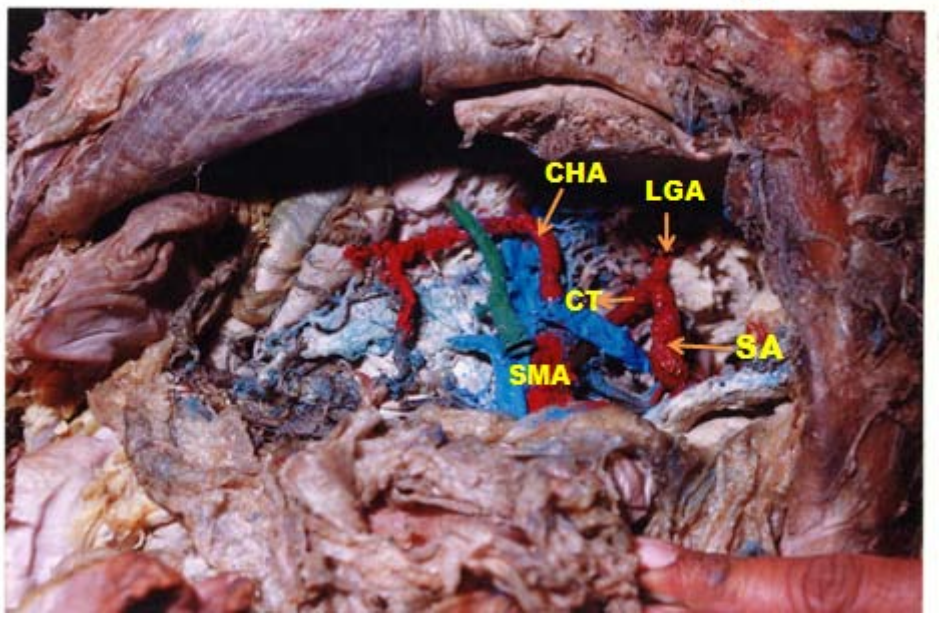
Fig-1 a) coeliac trunk **bifurcation** into 2 branches i.e. Left gastric and splenic arteries. b)CHA arises from superior mesenteric artery (Holinshed -10-15%)[2]. It then runs in front of the portal vein and right branch behind common bile duct where it gives Gastro duodenal artery Fig-2 a) Coeliac trunk divides into **abnormaltrifurcation** i.e. Left gastric, Splenic and Gastro duodenal arteries. b)CHA arises from superior mesenteric artery (Holinshed -10-15%)[2] it runs behind portal vein and bile duct to Porta- hepatis.

Fig-3 a) **Quadrifurcation** of coeliac trunk into splenic, hepatic, left gastric and superior mesenteric artery was seen, whicha very rare variation is. All the 3 branches i.e. Left gastric, Splenic and CHA and Superior mesentericartery arising fromCoeliac Mesentric axis of abdominal aorta. (Holinshed -1%)[2] b) Cystic branches arise from CHA and run deep to portal vein and common bile duct to deep surface of the gall bladder.

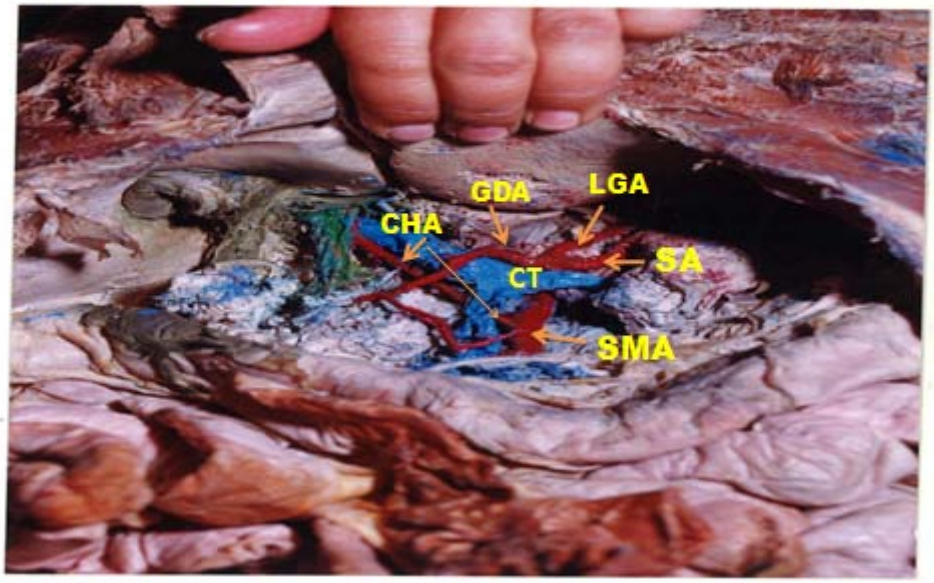
Fig-4 Pentafurcation of Coeliac trunkgives bilateral right and left inferior phrenic arteries(RIPA &LIPA) along with its usual 3 branches i.e..LGA,SA and CHA.

Coeliac trunk-CT,Splenic artery-SA, Left gastric artery-LGA,Common hepatic artery-CHA,Superior mesenteric artery-SMA, Right and Left inferior phrenic artery-RIPA &LIPA.

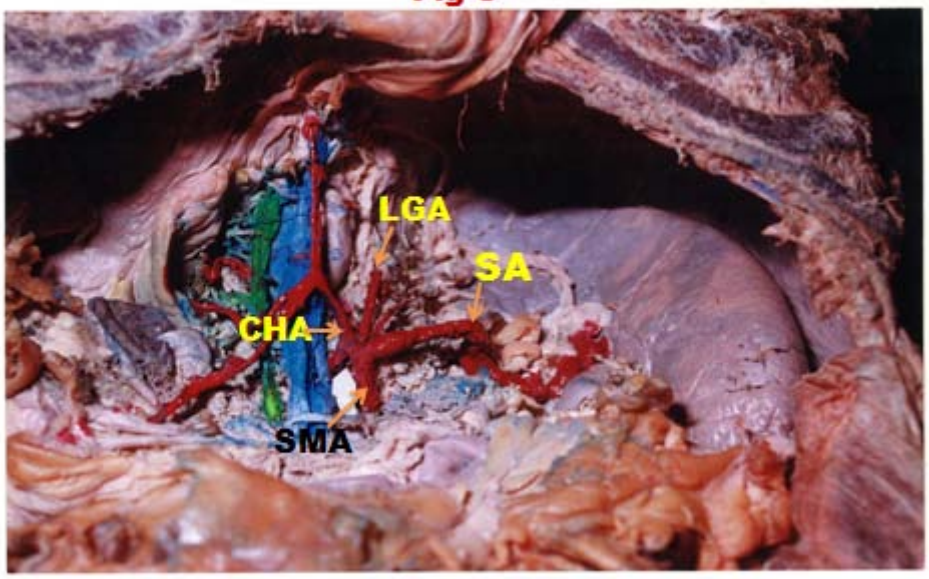
BIFURCATION OF COELIAC TRUNK INTO LGA and SA. CHA from SMA-Fig 1



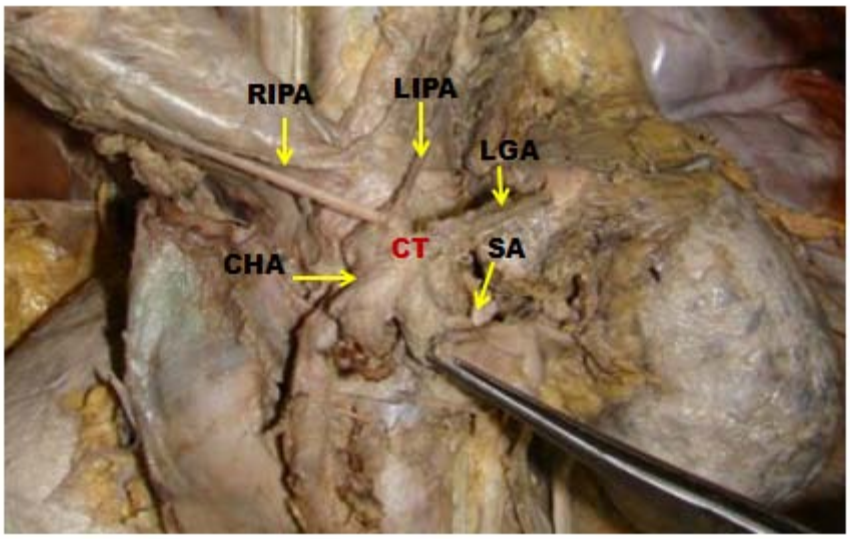
ABNORMAL TRIFURCATION OF THE COELIAC TRUNK INTO –LGA,SA &GDA.CHA from SMA.Fig-2



QUADRIFURCATION OF THE COELIAC TRUNK SMA, LGA, SA and CHA(coeliaco-mesenteric axis) Fig-3



PENTAFURCATION OF THE COELIAC TRUNK RIPA,LIPA,LGA,SA& CHA. Fig-4



IV. Discussion

Arterial vascularization of the gastrointestinal system is provided by anterior branches at three different levels of the abdominal aorta (the coeliac trunk and the superior and inferior mesenteric arteries). Differences arising during several developmental stages in the embryonic process lead to a range of variations in these vascular structures. Anatomical variations involving the visceral arteries are common and knowledge of them becomes important in patients undergoing diagnostic angiography for gastrointestinal bleeding or prior procedures such as laparoscopy and laparotomy or any major surgeries of upper abdomen. Therefore the variation concerning the CT should be kept in mind during both surgical and non-surgical evaluations. The anatomical variation of the CT or its branches makes it vulnerable to iatrogenic surgery. It enables to distinguish features which merit further investigations.

Data derived from past research on cadavers and living persons has shown a plethora of variations. About 15% of the individuals display significant variations form the typical branching pattern of the CT. The CT anatomy in routine examination showed that it can divide into 2-6 branches. Variations in the branches of the CT are most commonly reported once and many authors have reported different variation patterns. Additional branches of the CT other than its normal branches are referred to as collaterals.[3]The pattern of branching of the CT were observed to vary from classical trifurcation, to abnormal trifurcation, bifurcation , quadrifurcation , pentafurcation and even hexafurcation of the trunk.The additional branches of the trunk included the inferior phrenic artery, gastro duodenal artery, middle colic artery, dorsal pancreatic artery, jejunal or duodenal branch.Clinically relevant variations of the coeliac trunk were noted in many cases.[4] Two cadavers showed (Fig-2 & 4) additional branches i.e. GDA & IPA on right and on left sideThe coeliac trunk is widest ventral branch of the abdominal aorta and its unusual embryological developmentcan lead to considerable variations. The Coeliacomesentric trunk is a very rare about 1%-2.7%, of all anomalies involving the coeliac axis,which arose at the level of L1.[5] The Coeliacomesentric trunkis often fortuitous during autopsy dissections or can be accidently detectedby angiography or abdominal computed topography. The scanning without knowledge of the arterial architecture of the patient in this critical area can lead to surgical risk of error and lethal complications.The injury of the Coeliacomesentric trunk can involve ischemia to both foregut and midgut derivatives.[6] A rare case of absence of the Coeliac trunk.In such casesthe LGA, the SA, the CHA and the SMA arteries arising independently fromthe abdominal aorta.[7] In some cases all the four branches arise from common trunkmeans quadrifurcation of the coeliac trunk.The cadaver in the Fig-3, shows CT with quadrifurcation i.e. LGA, SA, CHA and SMA all of them arising from Coeliacomesentric trunk. The patterns of the coeliac trunk were observed to vary from classical trifurcation,to abnormal trifurcation, bifurcation, quadrifurcation, pentafurcation and even hexafurcation of the coeliac trunk. The present study in 4 male cadavers includes variation in the CT branches. The CT showed to abnormal trifurcation, bifurcation, quadrifurcation and pentafurcation. (Fig-1,2,3&4) Adachi & Michel et al have classified CT intosix types[8&9].

Type 1: Normal branching.

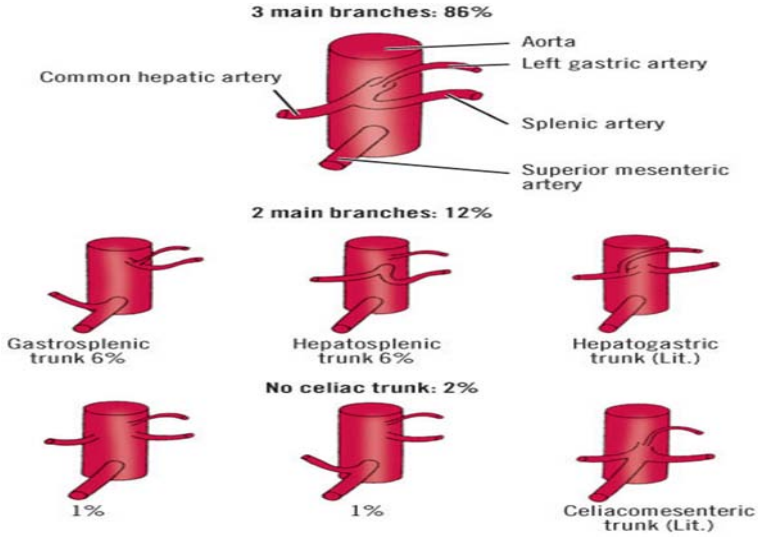
Type 2: Hepatosplenic trunk and left gastric from aorta.

Type 3: Hepatosplenomesentric trunk and left gastric from aorta.

Type 4: Hepatogastric trunk and splenic artery from superior mesenteric artery.

Type 5: Splenogastric type; splenic and left gastric from the coeliac trunk and common hepatic artery fromsuperior mesenteric artery.

Type 6: Coeliacomesentric trunk; left gastric, splenic, common hepatic and superior mesenteric artery arising from a common trunk.



The present study showed type 5 (Fig-1) and type 6 (Fig-3) of Adachi & Michel et al classification

The **Lipshutz** gave a detailed account of the CT based on the mode of origin and distribution of gastric, splenic and the hepatic arteries and classified into 4 types.[9]Type I:(75% cases) The coeliac axis was the common trunk of origin for the LGA, the SA and the CHA.

Type II:(15% cases) The HA and the SA arose from the CT but the LGA had varied origin, either from the HA or directly from the Abdominal aortaType III: (6% cases) The LGA and the HA took origin from the CT but the SA was a separate branch from the Abdominal aorta.

Type IV: The coeliac axis was the trunk of origin for the LGA and the SA and the CHA occurred as separate branch from the aorta.

The present study 36 cadavers showed with type I (76%) of Lipshutz classification. This is the normal pattern of branching of CT seen in 31 males and 5 females.

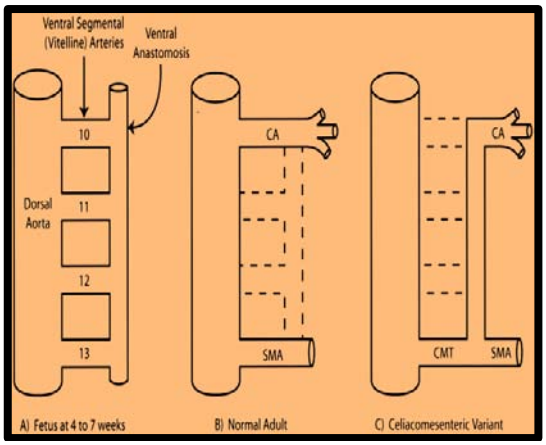
The variations of the CT are common but asymptomatic. They may become important during surgeries and radiological procedures. The CT in addition to LGA, SA and CHA may also sometimes give accessory right hepatic artery and both inferior phrenic arteries. These findings before operation is necessary to avoid post-operative complications and for better accurate radiological interpretations.[10] The bilateral origin of inferior phrenic arteries from the CT was observed in cadaver (Fig-4) presenting pentafurcation of CT. Similar findings was observed by Petrella et al (34.84%)[10] Knowledge about this variation avoids unintentional sectioning of small caliber arteries during the coeliac artery depression in compression syndrome of the CT by median arcuate ligament.

Classic branching of the coeliac artery into LGA, SA and CHA is seen in approximately 70%. Variations are present in 30% . In general any of the three coeliac branches may arise independently from the Aorta or SMA or coeliac artery may give rise to other branches.[11]**Extra coeliac origin of its branches**: [12]

1) From aorta- LGA 2-3%, SA-<1% and CHA-2%.
2) From SMA- LGA- extremely rare, SA <1% and CHA-
3) Other branches may arise from directly from CT, may e dorsal pancreatic artery , right hepatic artery, GDA or IPA(rt or left)
4) Others : Common origin of CT and SMA(coeliaco-mesenteric trunk)<1%In the cadaver (Fig-1), CHA from SMA and CT gave only two branches i.e. LGA & SA (bifurcation of CT), abnormal trifurcation with GDA (Fig-2) and quadrifurcation or coeliaco-mesenteric trunk(Fig-3) into four branches i.e. LGA, SA, CHA& SMA and finally in (Fig-4) CTpresented with pentafurcation giving rise to right and left IPA in addition to usual 3 branches LGA, SA & CHA. Fifteen types of coeliac axis anatomy with an aortic origin of major arteries including normal coeliac axis was studied in 5002 patient by Soon-Young Song MD et al.[13]

V. Embryological Basis For CT Variations

1) (Tandler-1904)[14]thevariations in the splanchnic vessels as suggested by Tandler. The ventral longitudinal anastomoses which connect the four roots of theventral splanchnic vesselsand the central two disappear. The 1st and 4th roots remain and connected via anastomoses. The CHA, LGA and SA usually originate from the 1st root and the SMA from the 4th root. The ventral longitudinal anastomosis usually separates between these two roots. If this separation occurs at a higher level, any one of the coeliac branches can be displaced to the SMA.
2) Theorigin of collaterals, particularly the IPA from the CT can be explained on the basis of Murakami Typological theory in 1995-1998.[15]According to him he proposed coeliaco-mesenteric system developsfromsix sets of paired left and right vessels(sub phrenic, upper, middle and lower ventricular and upper and lower intestinal arteries). These arteries are modified during the later stages of the fetal development. Collaterals may either persist or disappear between the longitudinal channels which may a factor to cause variable anatomy of the coeliac axis.
3) Others factors have been suggested to the variability of the coeliac axis include the rotation of the midgut and physiological herniation and leftward migration of the spleen and hemodynamic changes in the abdominal viscera.(Reuter & Redman-1977)[16]



VI. Conclusions

The **cadaveric findings of the coeliac artery variations and their subtypes in our study is fundamental,** that could help to minimize complications related to upper abdominal surgeries This article builds on previous reports and re-emphasizes the importance of coeliac artery variations for useful planning of surgical and radiological procedures of the upper abdomen, including laparoscopic operations of the biliary tract

The vascular variations are usually asymptomatic. The background knowledge for the different vascular patterns of the coeliac axis is vital and may become important in patients who undergo coeliacography for gastro-intestinal bleeding, coeliac axis compression syndrome, and prior to operative procedures or transcatheter therapy and for chemoembolization of the pancreas.

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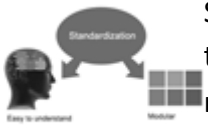

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3. Submission of Manuscripts,

4. Manuscript's Category,

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20. Use good quality grammar: Always use a good quality grammar and use words that will throw positive impact on evaluator. Use of good quality grammar does not mean to use tough words, that for each word the evaluator has to go through dictionary. Do not start sentence with a conjunction. Do not fragment sentences. Eliminate one-word sentences. Ignore passive voice. Do not ever use a big word when a diminutive one would suffice. Verbs have to be in agreement with their subjects. Prepositions are not expressions to finish sentences with. It is incorrect to ever divide an infinitive. Avoid clichés like the disease. Also, always shun irritating alliteration. Use language that is simple and straight forward. put together a neat summary.

21. Arrangement of information: Each section of the main body should start with an opening sentence and there should be a changeover at the end of the section. Give only valid and powerful arguments to your topic. You may also maintain your arguments with records.

22. Never start in last minute: Always start at right time and give enough time to research work. Leaving everything to the last minute will degrade your paper and spoil your work.

23. Multitasking in research is not good: Doing several things at the same time proves bad habit in case of research activity. Research is an area, where everything has a particular time slot. Divide your research work in parts and do particular part in particular time slot.

24. Never copy others' work: Never copy others' work and give it your name because if evaluator has seen it anywhere you will be in trouble.

25. Take proper rest and food: No matter how many hours you spend for your research activity, if you are not taking care of your health then all your efforts will be in vain. For a quality research, study is must, and this can be done by taking proper rest and food.

26. Go for seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.

27. Refresh your mind after intervals: Try to give rest to your mind by listening to soft music or by sleeping in intervals. This will also improve your memory.

28. Make colleagues: Always try to make colleagues. No matter how sharper or intelligent you are, if you make colleagues you can have several ideas, which will be helpful for your research.

29. Think technically: Always think technically. If anything happens, then search its reasons, its benefits, and demerits.

30. Think and then print: When you will go to print your paper, notice that tables are not be split, headings are not detached from their descriptions, and page sequence is maintained.

31. Adding unnecessary information: Do not add unnecessary information, like, I have used MS Excel to draw graph. Do not add irrelevant and inappropriate material. These all will create superfluous. Foreign terminology and phrases are not apropos. One should NEVER take a broad view. Analogy in script is like feathers on a snake. Not at all use a large word when a very small one would be sufficient. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Amplification is a billion times of inferior quality than sarcasm.

32. Never oversimplify everything: To add material in your research paper, never go for oversimplification. This will definitely irritate the evaluator. Be more or less specific. Also too, by no means, ever use rhythmic redundancies. Contractions aren't essential and shouldn't be there used. Comparisons are as terrible as clichés. Give up ampersands and abbreviations, and so on. Remove commas, that are, not necessary. Parenthetical words however should be together with this in commas. Understatement is all the time the complete best way to put onward earth-shaking thoughts. Give a detailed literary review.

33. Report concluded results: Use concluded results. From raw data, filter the results and then conclude your studies based on measurements and observations taken. Significant figures and appropriate number of decimal places should be used. Parenthetical remarks are prohibitive. Proofread carefully at final stage. In the end give outline to your arguments. Spot out perspectives of further study of this subject. Justify your conclusion by at the bottom of them with sufficient justifications and examples.

34. After conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print to the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects in your research.

Informal Guidelines of Research Paper Writing

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form, which is presented in the guidelines using the template.
- Please note the criterion for grading the final paper by peer-reviewers.

Final Points:

A purpose of organizing a research paper is to let people to interpret your effort selectively. The journal requires the following sections, submitted in the order listed, each section to start on a new page.

The introduction will be compiled from reference matter and will reflect the design processes or outline of basis that direct you to make study. As you will carry out the process of study, the method and process section will be constructed as like that. The result segment will show related statistics in nearly sequential order and will direct the reviewers next to the similar intellectual paths throughout the data that you took to carry out your study. The discussion section will provide understanding of the data and projections as to the implication of the results. The use of good quality references all through the paper will give the effort trustworthiness by representing an alertness of prior workings.

Writing a research paper is not an easy job no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record keeping are the only means to make straightforward the progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear

· Adhere to recommended page limits

Mistakes to evade

- Insertion a title at the foot of a page with the subsequent text on the next page
- Separating a table/chart or figure - impound each figure/table to a single page
- Submitting a manuscript with pages out of sequence

In every sections of your document

· Use standard writing style including articles ("a", "the," etc.)

· Keep on paying attention on the research topic of the paper

· Use paragraphs to split each significant point (excluding for the abstract)

· Align the primary line of each section

· Present your points in sound order

· Use present tense to report well accepted

· Use past tense to describe specific results

· Shun familiar wording, don't address the reviewer directly, and don't use slang, slang language, or superlatives

· Shun use of extra pictures - include only those figures essential to presenting results

Title Page:

Choose a revealing title. It should be short. It should not have non-standard acronyms or abbreviations. It should not exceed two printed lines. It should include the name(s) and address (es) of all authors.

Abstract:

The summary should be two hundred words or less. It should briefly and clearly explain the key findings reported in the manuscript--must have precise statistics. It should not have abnormal acronyms or abbreviations. It should be logical in itself. Shun citing references at this point.

An abstract is a brief distinct paragraph summary of finished work or work in development. In a minute or less a reviewer can be taught the foundation behind the study, common approach to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Yet, use comprehensive sentences and do not let go readability for briefness. You can maintain it succinct by phrasing sentences so that they provide more than lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study, with the subsequent elements in any summary. Try to maintain the initial two items to no more than one ruling each.

- Reason of the study - theory, overall issue, purpose
- Fundamental goal
- To the point depiction of the research
- Consequences, including definite statistics - if the consequences are quantitative in nature, account quantitative data; results of any numerical analysis should be reported
- Significant conclusions or questions that track from the research(es)

Approach:

- Single section, and succinct
- As a outline of job done, it is always written in past tense
- A conceptual should situate on its own, and not submit to any other part of the paper such as a form or table
- Center on shortening results - bound background information to a verdict or two, if completely necessary
- What you account in an conceptual must be regular with what you reported in the manuscript
- Exact spelling, clearness of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else

Introduction:

The **Introduction** should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable to comprehend and calculate the purpose of your study without having to submit to other works. The basis for the study should be offered. Give most important references but shun difficult to make a comprehensive appraisal of the topic. In the introduction, describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will have no attention in your result. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here. Following approach can create a valuable beginning:

- Explain the value (significance) of the study
- Shield the model - why did you employ this particular system or method? What is its compensation? You strength remark on its appropriateness from a abstract point of vision as well as point out sensible reasons for using it.
- Present a justification. Status your particular theory (es) or aim(s), and describe the logic that led you to choose them.
- Very for a short time explain the tentative propose and how it skilled the declared objectives.

Approach:

- Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done.
- Sort out your thoughts; manufacture one key point with every section. If you make the four points listed above, you will need a least of four paragraphs.

- Present surroundings information only as desirable in order hold up a situation. The reviewer does not desire to read the whole thing you know about a topic.
- Shape the theory/purpose specifically - do not take a broad view.
- As always, give awareness to spelling, simplicity and correctness of sentences and phrases.

Procedures (Methods and Materials):

This part is supposed to be the easiest to carve if you have good skills. A sound written Procedures segment allows a capable scientist to replacement your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt for the least amount of information that would permit another capable scientist to spare your outcome but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section. When a technique is used that has been well described in another object, mention the specific item describing a way but draw the basic principle while stating the situation. The purpose is to text all particular resources and broad procedures, so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step by step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

- Explain materials individually only if the study is so complex that it saves liberty this way.
- Embrace particular materials, and any tools or provisions that are not frequently found in laboratories.
- Do not take in frequently found.
- If use of a definite type of tools.
- Materials may be reported in a part section or else they may be recognized along with your measures.

Methods:

- Report the method (not particulars of each process that engaged the same methodology)
- Describe the method entirely
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures
- Simplify - details how procedures were completed not how they were exclusively performed on a particular day.
- If well known procedures were used, account the procedure by name, possibly with reference, and that's all.

Approach:

- It is embarrassed or not possible to use vigorous voice when documenting methods with no using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result when script up the methods most authors use third person passive voice.
- Use standard style in this and in every other part of the paper - avoid familiar lists, and use full sentences.

What to keep away from

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings - save it for the argument.
- Leave out information that is immaterial to a third party.

Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part a entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Carry on to be to the point, by means of statistics and tables, if suitable, to present consequences most efficiently.You must obviously differentiate material that would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matter should not be submitted at all except requested by the instructor.

Content

- Sum up your conclusion in text and demonstrate them, if suitable, with figures and tables.
- In manuscript, explain each of your consequences, point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation an exacting study.
- Explain results of control experiments and comprise remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or in manuscript form.

What to stay away from

- Do not discuss or infer your outcome, report surroundings information, or try to explain anything.
- Not at all, take in raw data or intermediate calculations in a research manuscript.
- Do not present the similar data more than once.
- Manuscript should complement any figures or tables, not duplicate the identical information.
- Never confuse figures with tables - there is a difference.

Approach

- As forever, use past tense when you submit to your results, and put the whole thing in a reasonable order.
- Put figures and tables, appropriately numbered, in order at the end of the report
- If you desire, you may place your figures and tables properly within the text of your results part.

Figures and tables

- If you put figures and tables at the end of the details, make certain that they are visibly distinguished from any attach appendix materials, such as raw facts
- Despite of position, each figure must be numbered one after the other and complete with subtitle
- In spite of position, each table must be titled, numbered one after the other and complete with heading
- All figure and table must be adequately complete that it could situate on its own, divide from text

Discussion:

The Discussion is expected the trickiest segment to write and describe. A lot of papers submitted for journal are discarded based on problems with the Discussion. There is no head of state for how long a argument should be. Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implication of the study. The purpose here is to offer an understanding of your results and hold up for all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of result should be visibly described. Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved with prospect, and let it drop at that.

- Make a decision if each premise is supported, discarded, or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."
- Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work
- You may propose future guidelines, such as how the experiment might be personalized to accomplish a new idea.
- Give details all of your remarks as much as possible, focus on mechanisms.
- Make a decision if the tentative design sufficiently addressed the theory, and whether or not it was correctly restricted.
- Try to present substitute explanations if sensible alternatives be present.
- One research will not counter an overall question, so maintain the large picture in mind, where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

- When you refer to information, differentiate data generated by your own studies from available information
- Submit to work done by specific persons (including you) in past tense.
- Submit to generally acknowledged facts and main beliefs in present tense.

Administration Rules Listed Before Submitting Your Research Paper to Global Journals Inc. (US)

Please carefully note down following rules and regulation before submitting your Research Paper to Global Journals Inc. (US):

Segment Draft and Final Research Paper: You have to strictly follow the template of research paper. If it is not done your paper may get rejected.

- The **major constraint** is that you must independently make all content, tables, graphs, and facts that are offered in the paper. You must write each part of the paper wholly on your own. The Peer-reviewers need to identify your own perceptive of the concepts in your own terms. NEVER extract straight from any foundation, and never rephrase someone else's analysis.

- Do not give permission to anyone else to "PROOFREAD" your manuscript.

- Methods to avoid Plagiarism is applied by us on every paper, if found guilty, you will be blacklisted by all of our collaborated research groups, your institution will be informed for this and strict legal actions will be taken immediately.)
- To guard yourself and others from possible illegal use please do not permit anyone right to use to your paper and files.

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Topics	Grades		
	A-B	**C-D**	**E-F**
Abstract	Clear and concise with appropriate content, Correct format. 200 words or below	Unclear summary and no specific data, Incorrect form Above 200 words	No specific data with ambiguous information Above 250 words
Introduction	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
Methods and Procedures	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
Result	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
Discussion	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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