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Discovering Thoughts, Inventing Future

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Dynamic Postural Balance in Patients with Temporomandibular Disorders (TMD)

By Flores Lara Alejandro, Espinosa de Santillana Irene, Rebollo Vásquez Jaime, Silva Avelar Janeth & López Martínez Margarita

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Abstract- Temporomandibular Disorders (TMD) is a set of painful conditions that involve the masticatory muscles, Temporomandibular Joint (TMJ), and/or associated orofacial structures. Some studies have established that patients with TMD present postural alterations.

Objective: To assess Dynamic Postural Balance (DPB) in patients with Temporomandibular Disorders (TMD) compared to a control group at the Stomatology Clinic of the Autonomous University of Puebla (BUAP).

Materials and methods: Forty patients with TMD were tested, diagnosed by a standardized researcher with DC/TMD; 75% female average aged 27.7±9.5 and 40 controls without TMD, paired by age and sex without significant differences in body mass index (BMI) between groups ($p>.05$). The 80 patients were tested with the Biodex® Stability System of the Physiotherapy School of the Autonomous University of Puebla (BUAP) by a trained researcher.

Keywords: postural balance, temporomandibular disorders, balance.

GJMR-J Classification: NLMC Code: WU 140.5

Strictly as per the compliance and regulations of:

Dynamic Postural Balance in Patients with Temporomandibular Disorders (TMD)

Flores Lara Alejandro [α], Espinosa de Santillana Irene [σ], Rebollo Vásquez Jaime [ρ], Silva Avelar Janeth [ω] & López Martínez Margarita [¥]

Abstract- Temporomandibular Disorders (TMD) is a set of painful conditions that involve the masticatory muscles, Temporomandibular Joint (TMJ), and/or associated orofacial structures. Some studies have established that patients with TMD present postural alterations.

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Results: The Dynamic Postural Balance of patients with TMD resulted similar as the control ones. Descriptively, the Overall Index was lower in patients with TMD (1.66±.94 vs. 1.83±1.27), as well as the Anterior-Posterior Index (1.20±.73 vs. 1.26±.83), the Medial-Lateral Index (.92±.45 vs. 1.05±.84), and the permanence time in the optimum balance zone (95.62 vs. 93.65), without statistically significant differences in the three indices ($p>0.05$).

Conclusion: The Dynamic Postural Balance of patients with TMD is equal as the control ones.

Keywords: postural balance, temporomandibular disorders, balance.

I. Introduction

Temporomandibular Disorders (TMD) is a collective term embracing all the problems relating to Temporomandibular Joint (TMJ), the masticatory muscles, and/or associated orofacial structures as bones, ligaments, and cartilages[1-2].

Over 25% of the adult population presents symptoms of TMD, nevertheless, only a small percentage of affected individuals look for treatment[3]. Other studies conducted in this same population have detected TMD symptoms from 16% to 59%[4], but only 3% to 7% seek treatment for pain and dysfunction associated to TMD[5]. Yuasa additionally reports that approximately 75% of the population has at least one TMD sign and 33% has at least one symptom, but only 3.6% to 7% seeks treatment for severe TMD symptoms[6].

In addition, TMD symptoms occur disproportionately between sexes, with an increased incidence reported in women; the female-male ratio ranges between 2:1 and 8:1[7-10]. Most of the patients who present symptoms are between 20 and 50 years old[11-12].

On the other hand, Postural Balance has been defined by Riemann et al[13] as the process of coordinating corrective movement strategies and movements at the selected joints to remain in postural equilibrium. Dynamic Postural Balance is the ability to maintain the center of gravity over the base of support while it moves or an external disturbance is applied to the body. There are some studies in the bibliography which suggest a link between the Temporomandibular Joint (TMJ)/dental occlusion and posture. Some authors have reported postural alterations in subjects with TMD in comparison to healthy ones[14]. Other studies inform that patients with TMD have an advanced cephalic position in contrast to subjects without TMD[15]. Changes in mandibular position induced or not by TMD, may influence in the neck and posture muscles[16-18] and such subjects have a deviation in the anterior or posterior pelvic line[19]. To emphasize this, it has been demonstrated that changes in the mandibular position cause changes in the electromyographyc activity of the masticatory muscles and neck muscles (trapezius and sternocleidomastoid), which suggest that alterations in the mandibular position disturb the cervico-craneal system[20]. Some studies have established that patients with TDM have a higher prevalence of cervical hyperlordosis[21].

Furthermore, it has been shown the influence of the various mandibular positions in the postural balance, specifically, the myocentric mandibular position has proved to improve postural balance[22].

Apparently, the Postural Balance has an association with Temporomandibular Disorders and/or dental occlusion, so that the objective of the current study was to establish the association between Temporomandibular Disorders and the Dynamic Postural Balance in patients with any ailment in comparison with a control group from the Stomatology

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Clinic of the Autonomous University of Puebla (BUAP), Mexico..

II. Materials and Methods

A prolective, case-control study was conducted at the Stomatology Clinic of the Autonomous University of Puebla. Through convenience sampling method, in which 40 patients per group were selected.

Forty patients with TMD were tested, diagnosed by a standardized researcher with DC/TMD; 75% female average aged 27.7±9.5 and 40 controls without TMD, paired by age and sex without significant differences in body mass index (BMI) between groups (p>.05). To assess the Dynamic Postural Balance, the Biodex Stability System was used (BSS) (Biodex Medical Systems, Shirley, NY, USA), which consists of a movable multiaxial balance platform that provides up to 20° of surface tilt in a 360° range of motion. The prearranged level of instability of the platform ranged between a slightly unstable surface, level of stability 8, to a very unstable surface, level of stability 2. Three indices were obtained electronically based on the platform degree tilt: Anterior-Posterior Stability Index (APSI), Medial-Lateral Stability Index (MLSI) and the Overall Stability Index (OSI). Additionally, the system determined the percentages of time used in the four concentric balance zones: A, B, C and D as shown in Figure 1. Lower values in the Dynamic Postural Balance Indices represent better stability than the higher ones; in the same way a greater permanence in the most peripheral zones reveals a poor balance.

Once obtained the results, a database was developed with the SPSS v.19 statistical program, for the analysis with descriptive statistics (mean, median, mode and standard deviation) and inferential statistics. The Dynamic Postural Balance difference between groups was assessed by the Student's T-test, with statistical significance <.05.

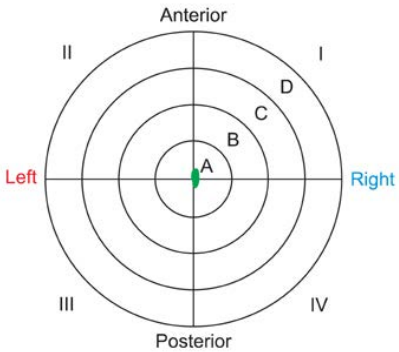


Fig. 1 : Indices and balance zones of the Biodex Balance System

III. Results

Forty patients with TMD were tested, diagnosed by a standardized researcher with DC/TMD; 75% female average aged 27.7±9.5 and 40 controls paired by age and sex without significant differences in BMI between groups (p>.05).

As shown in Table 1, the three índices: OSI, APSI and MLSI revealed a slightly better balance in the cases, compared to the control ones. Nevertheless, none of the above comparisons showed statistical significance.

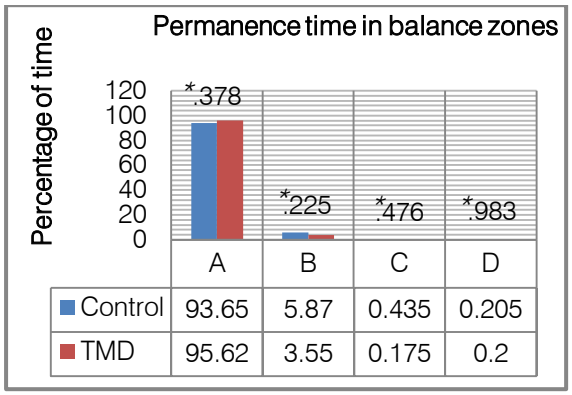
Table 1 : Comparison by group of the Dynamic Postural Balance Indices

Indices	Group				
	Cases n=40		Controls n=40		
	$\bar{x}$	SD	$\bar{x}$	SD	*p
OSI	1.66	.94	1.83	1.27	.507
APSI	1.20	.73	1.26	.83	.754
MLSI	0.92	.45	1.05	.84	.431

** Student's T-test*

The permanence time in the balance zones showed that the group cases remained more time in the optimum balance zone (A) compared to the control group. None of the above comparisons showed statistical significance.

Table 2 : Comparison by group of the percentage of time in balance zones



** Student's T-test*

IV. Discussion

The current study did not find association between the Temporomandibular Disorders and the Dynamic Postural Balance.

Descriptively, the three balance indices: OSI, APSI and MLSI, as well as the permanence time in the optimum balance zone (A) were lower in the TMD group, however, it did not show statistically significant differences between groups.

Authors as Lee and Okeson[15] proved that patients with TMD show an advanced cephalic position, Zonnenberg and Van Maanen[19] revealed a deviation in the anterior or posterior pelvic line in patients with TMD,

Munhoz and colleagues[21] observed that patients with TMD have higher prevalence of cervical hyperlordosis, all this leads to the hypothesis that TMD could affect Postural Balance.

Kittel and Bérzin[23] assessed through the Chattecx Balance System the stability and weight distribution in orthostatic position of subjects with TMD and a control group. Those authors demonstrated that the TMD group has greater symmetrical weight distribution than the control group, similar to the results of the current study, however, Kittel and Bérzin found statistically significant differences between groups.

These results could be supported by the fact that subjects with present TMD reduced muscular activity throughout maximum intercuspation due to a protective effect to minimize Temporomandibular Joint movement, this coupled to presence of pain in patients with TMD, also appears to has an effect in reduction of body sway[24].

Perinetti[25], on the other hand, by the use of the Lizard statokinesigram, researched on the correlation between TMD and postural alterations and did not find statistically significant differences in evaluating a group of patients with TMD and a control group, as in the current study. It should be noted that one of the possible explanations for the type of instrument could support the controversy in the results reported in the literature used to determine the Postural Balance. The Biodex Stability System (Biodex Medical Systems, Shirley, NY, USA), instrument used in this study, consists of a movable multiaxial circular platform with 360° range of motion, with the potential of varying surface tilt, which makes the Postural Balance assessment to be carried out in a fully dynamic position.

This instrument has demonstrated reliability and validity in previous studies[26-27]. On the other hand, other studies have used different instruments to assess Postural Balance. These other instruments do not allow dynamic multiaxial assessment of Postural Balance, as the Chattecx Balance System and others, these latter only uses force plates combined with software to determine the center of gravity and based on this, measure the rate of Postural Balance. Such diversity in the use of instruments could be the main cause of the controversial result found in the literature.

The main strength of this study is based on the use of a valid and reliable instrument to establish the Postural Balance Index; it is noteworthy that there is no bibliographical evidence that has assessed Dynamic Postural Balance within concentric zones mentioned above. In the current study, it was observed that patients with TMD presented higher percentages of optimal balance (95.6%) compared to the control subjects (93.6%), although no significant differences were denoted. On the other hand, a weakness of this research lies in the absence of a prior calculation of sample size, which could influence in the absent association between Temporomandibular Disorders and Dynamic Postural Balance reported in the current study.

V. Conclusion

The Dynamic Postural Balance of patients with TMD; OSI, APSI, MLSI, as well as the permanence time in optimum balance zone, is equal to the control ones.

VI. Bibliography

1. De Leeuw, R., 2008. Orofacial Pain: Guidelines for classification, assessment, and management. 4th ed. Chicago: Quintessence Publ. Co.
2. Scrivani, S., Keith, D., Kaban, L., 2008. Temporomandibular disorders. The New England Journal of Medicine, 359, pp.2693-705.
3. Solberg, W.K., Woo, M.W., Houston, J.B., 1979. Prevalence of mandibular dysfunction in young adults. Journal of the American Dental Association, 98, pp.25–34.
4. Sessle, B.J., Bryant, P., Dionne, R., 1995. Temporomandibular Disorders and Related Pain Conditions. Seattle: IASP.
5. Carlsson, G.E., 1999. Epidemiology and treatment need for temporomandibular disorders Journal of Orofacial Pain, 13, pp.232–237.
6. Yuasa, H., Kino, K., Kubota, E., Kakudo, K., Sugisaki, M., Nishiyama, A., et al., 2013. Primary treatment of temporomandibular disorders: The Japanese Society for the temporomandibular joint evidence-based clinical practice guidelines. The Japanese Dental Science Review. 49(3), pp.89-98.
7. Martins-Junior, R.L., Palma, A.J., Marquardt, E.J., Gondin, T.M., Kerber. 2010. Temporomandibular disorders: A report of 124 patients. The Journal of Contemporary Dental Practice. 11, pp.71–78.
8. Wilkes, C.H., 1989. Internal derangements of the temporomandibular joint. Pathological variations. Archives of otolaryngology--head & neck surgery. 115, pp.469–477.
9. Hagernan, P.A., Leibowitz, J.M., Blanke, D., 1995. Age and gender effects on postural control measures. Archives of physical medicine and rehabilitation. 76, pp. 1-5.
10. Horak, F.B., Henry, S.M., Shummway-Cook, A., 1997. Postural perturbations: new insights for treatment of balance disorders. Physical Therapy. 77, pp. 517-33.
11. Warren, M.P., Fried, J.L., 2001. Temporomandibular disorders and hormones in women. Cells Tissues Organs. 169, pp.187–192.
12. Van Loon, J.P., de Bont, L.G., Stegenga, B., Spijkervet, F.K., Verkerke, G.J., 2002. Groningen temporomandibular joint prosthesis. Development and first clinical application. International journal of oral and maxillofacial surgery . 31, pp. 44–52.

13. Riemann, B.L. Guskiewicz, K.M., Shields, E.W., 1999. Relationship between clinical and forceplate measures of postural stability. Journal of sport rehabilitation. 8(2), pp. 71-82.
14. Huggare, J.A., Raustia, A.M.,1992 Head posture and cervicoverte¬bral and craniofacial morphology in patients with cranio¬mandibular dysfunction. Cranio: the journal of craniomandibular practice. 10, pp. 173-9.
15. Lee, W.Y, Okeson, J.P, Lindroth, J., 1995. The relationship between forward head posture and temporomandibular disorders. Journal of orofacial pain 9, pp. 161-7.
16. Grace, M., Alpert, P., Cross, C., Louis, M., Kowalski, S., 2012. Postural balance in young adults: the role of visual, vestibular and somatosensory systems. Journal of the American Association of Nurse Practitioners. 24(6), pp. 375-381.
17. Daly, P., Preston, C.B, Evans, W.G., 1982. Postural response of the head to bite opening in adult males. American journal of orthodontics. 82, pp. 157-60.
18. Salonen, M.A., Raustia, A.M., Huggare, J.A., 1994 Changes in head and cervicalspine postures and EMG activities of masticatory muscles following treatment with complete upper and partial lower denture. The Journal of cranio-mandibular practice. 12, pp. 222-6.
19. Zonnenberg, A.J.J., Van Maanwn, C.J., 1996 Body posture photographs as diagnostic aid for musculoskeletal disorders related to temporomandibular disorders. The Journal of cranio-mandibular practice. 14, pp. 225-232.
20. Ceneviz, C., Noshir, R., Forgione, A., Sands, M.J., Abdallah, E., Lobo, S., Mavroudi, S., 2006. The Immediate Effect of Changing Mandibular Position on the EMG Activity of the Masseter, Temporalis, Sternocleidomastoid, and Trapezius Muscles. The Journal of cranio-mandibular practice. 24(4), pp. 237-244.
21. Munhoz, W., Pasqual, M., Tesseroli, J., 2004 Radiographic evaluation of cervical spine of subjects with temporomandibular joint internal disorder. Brazilian oral research. 18(4), pp. 283-289.
22. Bracco, P., Deregibus, A., Piscetta, R., 2004 Effects of different jaw relations on postural stability in human subjects. Neuroscience letters. 356(3), pp. 228-230.
23. Kittel, L., Bérzin, F., 2008. Analysis of the postural stability in individuals with or without signs and symptoms of temporomandibular disorder. Brazilian oral research . 22(4), pp. 378-83.
24. Chandu, A., Suvinen, T.I., Reade, P.C., Borromeo, G.L., 2004. The effect of an interocclusal appliance on bite force and masseter electromyography in asymptomatic subjects and patients with temporo-mandibular pain and dysfunction. Journal of oral rehabilitation. 31, pp. 530-537.
25. Perinetti, G., 2007. Temporomandibular disorders do not correlate with detectable alterations in body posture. The journal of contemporary dental practice. 8(5), pp. 1-9.
26. Cachupe, W., Shifflett, B., Kahanov, L., Wughalter, E., 2001. Reliability of Biodex Balance System Measures. Measurement in physical education and exercise science. 5(2), pp. 97-108.
27. Hinman, M., 2000. Factors Affecting Reliability of the Biodex Balance System: A Summary of Four Studies. Journal of sport rehabilitation. 9(3), pp. 240-252.

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The Wide Array of Surgical Manoevers in External Rhinoplasty

By Dr. Deepalakshmi Tanthry, Tanthry Gururaj, Devan PP, Kavitha A & Bhandary Rukma
AJ Institute of Medical Sciences, India

Abstract- *Introduction:* In the last few decades external approach to rhinoplasty has gained enormous popularity for the correction of functional and aesthetic problems of face. Our study aims to demonstrate the wide array of surgical manoeveres that can be done by external rhinoplasty.

Materials And Methods: This prospective study was done in AJ Institute of Medical Sciences. 52 patients were presenting to our outpatient department with nasal deformity with or without nasal obstruction between January 2010 to 2011 were selected.

Results: Among the 52 patients who underwent external rhinoplasty 44 (84.6%) were males and 8 (15.6%) were females. 16 (30.8%) had deviated nose, 10 (19.2%) had tension nose, 23 (44.2%) had various tip deformities and 3 (5.8%) had saddle nose.

Conclusion: External approach facilitates full exposure of osseocartilagenous vault, easy implementation of modern rhinoplasty techniques to yield an aesthetic result well balanced with other facial components.

Keywords: *rhinoplasty, external approach, tip deformities, tension nose, deviated nose.*

GJMR-J Classification: *NLMC Code: WU 140*

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The Wide Array of Surgical Manoevers in External Rhinoplasty

Dr. Deepalakshmi Tanthry [α], Tanthry Gururaj [σ], Devan PP [ρ], Kavitha A [ω] & Bhandary Rukma [¥]

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I. Introduction

Among the frequently performed plastic surgery operations rhinoplasty is the most difficult to obtain consistently good results. It is very challenging for young surgeons to modify the external appearance of the nose and restore or maintain a good airway[1].External approach to rhinoplasty offers several distinct advantages over classical endonasal approach for incising, repositioning, excising and augmenting the framework of the nose for functional and aesthetic improvement[2]. This prospective study aims at demonstrating the wide array of surgical manoeveres that can be performed using external approach in rhinoplasty.

II. Materials and Methods

This study was conducted in the Department of Otorhinolaryngology and Head & Neck Surgery of AJ Institute Of Medical Sciences, Mangalore between 2010 – 2011. 52 patients who presented to the out patient department with nasal deformities alone or combined with nasal obstruction were included in the study. A detailed pre-operative evaluation including medical history, clinical examination and photo documentation was done before the surgical procedure. All the surgeries were done under general anaesthesia and inverted V shaped transcolumellar incision was used. Bilateral marginal incisions were made using no 15 blade perpendicular to the skin, pocket was created underneath skin. Marginal incisions were extended at least halfway along the vestibulum. Spreading movements using tenotomy scissors were made to obtain adequate exposure of nasal skeleton[3]. (Fig 1 External rhinoplasty) Dissection was done in direct perichondrial plane to prevent intraoperative bleeding and to enhance the healing process. Nasal septum can be accessed by dividing tissue between the medial crura or alternatively by a separate hemitransfixion or Killian's incision[4].In our study septoplasty was done by using a separate hemitransfixion incision. The harvested septal cartilage was used in various tip procedures. The graft was placed in a well defined pocket between crura and extended from 2 mm above anterior nasal spine to the angle between medial and intermediate crura. To prevent asymmetry at the caudal plane of the columella and in the dome, medial crurae were fixed temporarily with a needle after which final fixation with mattress sutures were applied with 2 O vicryl. The graft was also used to strengthen weak medial crura, correct tip asymmetries. Dorsal humps were rasped under direct visualisation where as intermediate osteotomies were done to mobilise frontal process of maxilla and their attached upper lateral cartilages. In cases of saddle nose, autologous rib cartilage was harvested and used for augmentation. The wound was closed with non absorbable 5 O ethilon and plaster of paris cast was applied. The sutures were removed along with the cast after seven days and photo documentation was done.

III. Observation and Results

Of the 52 patients who underwent external rhinoplasty, 44 (84.6%) were males and 8 (15.4%) females. Age of the patient ranged from 18 to 47 years with a mean of 28 +/- 2.2 years. Most of the patients (84%) belonged to the age group 20 to 40 years. 16 (30.8%) had crooked nose, 10 (19.2%) tension nose, 23 (44.2%) had various tip deformities and 3 (5.8%) had saddle nose. (Fig 1). The patients were followed up after 1, 3 and 6 months.

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IV. Discussion

External rhinoplasty is a surgical technique that allows through the transverse incision of the columella to access osteocartilaginous structures of the nose thanks to a direct and wide vision of the incision site [5]. In the last decade, external approach has gained enormous popularity in rhinoplasty. The indications are – Asymmetry of alar cartilages or upper lateral cartilages, nasal tip with lack of support, rotation or overprojection over projected nose, saddle nose or for revision rhinoplasty [3]. The common deformities of the upper two thirds of nose are – dorsal saddling, dorsal irregularities, valve collapse, open roof or polly beak deformities where as deformities of the lower two thirds of the nose are higher incidences of depressed tip, tip over rotation, tip asymmetry, retracted columella and alar notching [6]. In our study, tip deformities were the most common 23 (44.2%). Among the tip deformities, broadened nasal tip 8 (34.7%) was very commonly encountered, followed by tip rotation 6 (26%), asymmetry of nasal tip 5 (21.8%) and depressed nasal tip 4(17.3%). Structure concept of rhinoplasty advocates conservative resection of supportive tissues (cartilage and bone), preservation of major and minor support mechanisms, reconstitution of any support mechanisms divided or compromised and the use of suture techniques or grafts to increase support or provide the necessary structures that may be needed to stabilise the bone[6]. (Fig 2 Tip deformity before and after) External incision creates a large surgical access that makes it possible to model the shape of the nose by inserting and fixing cartilage grafts. External approach is more easy and accurate not only for removal of cartilage from the septum but also for more accurate and stable placement of grafts in different sites [5]. In our study, external incision offered easy exposure of the lower lateral cartilages. Excessive caudal edge of the lateral crura was excised to narrow the nasal tip and to improve the tip definition. Autologous septal cartilage was used as a graft to increase tip projection and increase the tip support. The tip graft was sutured to the caudal margin of the medial crura with 3 O vicryl to provide a bidomal tip configuration and as a solid structure that will resist the forces of scar contracture. The stability of the nasal tip requires additional sutures between the medial crura of the lower lateral cartilages[7]. Intra domal sutures were applied with 2 O vicryl to increase tip definition as well as to narrow the nasal tip in order to give a more youthful appearance. Vertical dome division using cartilage overlap and suturing to re establish integrity of alar cartilage is indicated in lobule asymmetry, retro displacement, wide domal arch, hanging infra tip lobule and rotation of the tip[8].(Fig 3 Tip before and after) This method was adopted in few cases of traumatic lobule asymmetry in our study.

The major aim of septo rhinoplasty is the treatment of overall internal and external nasal defects[9]. External approach to deviated nose lends itself well to accurate correction of such a deformity due to added exposure it provides and ability to place corrective grafts[4]. In our series, deviated nose were treated through external rhinoplasty.(Fig 4 Deviated nose before and after) Septoplasty was done via a separate hemitransfixion incision and osteotomies were performed under direct vision. External incision facilitates excellent control of osteotomies, fewer incidences of open roof and lateral step without causing visible scar[10].

Tension nose is defined as nose with high nasal dorsum with stretching of the overlying skin and soft tissue together with a highly arched and narrow nasal vault. There is an overgrowth of quadrilateral nasal septum along both dorsal and caudal aspects which exerts a pedestal effect by pushing lower lateral cartilage in a forward and downward direction, causing a blunting and anterior displacement of the nasolabial angle and shortening of the upper lip. Excision of excessive elements of nasal septum and anterior spine followed by reprojection of the domes using tip grafts and suture techniques. Such measured modifications can be performed with precision using external approach[4]. Cases of tension nose in our study were cosmetically corrected using the external approach.(Fig 5 Tension nose before and after external rhinoplasty) Common incorporation of certain manoeveres offers more consistent aesthetically pleasing and superior functional outcomes. Improved exposure afforded by external rhinoplasty has allowed for precise surgical manoeveres and makes more consistent results possible[11].

V. Conclusion

External approach will achieve better understanding of patient's individual anatomy and thus leads to a more predictable result through increased exposure and precision tailoring. The external technique facilitates the application of a great variety of tip refinements[12]. This study demonstrates that a wide range of manoeveres can be performed using external approach. The advantages are full exposure of osseocartilagenous vault, easy implementation of modern rhinoplasty techniques and tip sutures. External approach facilitates modification of nasal tip deformities and asymmetries to gain an aesthetic result balanced with other facial components.

References Références Referencias

1. Adant JP, Bluth F, Fissette J, External rhinoplasty – A useful approach for a young Plastic Surgeon: Ann Chir Plast Esthet 1998 Dec ; 43(6):635-48.
2. Becker FF, External approach to Rhinoplasty: J Fla Med Assoc 1990 May; 77(5); 511-5.
3. Petropoulos I, Karagiannidis K, Kontzoglou G, Our experience in Open Rhinoplasty: Hipokratio 2007 Mar:11(1);35-8.

4. Trenite GN, Paun SH, External Rhinoplasty : Scott Brown's Textbook of Otorhinolaryngology and Head & Neck Surgery: Vol 3:2008; 2959 – 70.
5. Inchingolo F, Tatullo M, Marrelli M, Inchingolo A, Semi open Rhinoplasty, a new maxillofacial technique: Head & Face Medicine Vol 8:2012:13.
6. Kyung S, Concept and techniques of Open structure Rhinoplasty, Mar 1998.
7. Konstantindis I, Malliari H, Metxas S, Nasal trauma: Primary Reconstruction with open rhinoplasty, Can J Plast Surg 2011;19(3);108-10.
8. Adamson PA,Mc Grawwall BL, Morrow TA, Constantinds MS, Vertical dome division in Open Rhinoplasty; An Update on indications, techniques and results, Arch Otolaryngol Head Neck Surg 1994 Apr; 120(H);373-80.
9. Ulldemolins M N,Barcelocolomer X, Tejerina DS,Combined nasal approach; Maxilla premaxilla approach and external appearance, Acta Otorhinol-aryngol Esp 2004 Dec:55(10):475-81.
10. Escobar S, Marquez DF, Vilacampa A, External lateral osteotomy in rhinoplasty for the correction of nasal dorsal deviation, Acta Otorhinolaryngol Esp 2002 Nov;53(9);662-5.
11. Ponsky D, Eshraghi Y, Guyron B, The frequency of surgical manoeveres during open rhinoplasty, Plast Reconstr Surg 2010:Jul: 126 (1):240-4.
12. Perlman PW, Nathan MJ,Cosmetic Rhinoplasty using external approach; Ear Nose Throat J 1991 Jul;70(7): 425-30.

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Study of Pathological Variations of Solitary Thyroid Nodule

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Abstract- *Objective:* To find out the incidence of malignancy in patient with solitary thyroid nodule.

Methods: This cross-sectional study was carried out with 100 solitary thyroid nodular patients who admitted in Otolaryngology & Head-Neck Surgery Department of Sir Salimullah Medical College Mitford Hospital (SSMCMH) & Bangabondhu Sheikh Mujib Medical Univercity (BSMMU), Dhaka, from July 2011 to December 2012,where all patients were admitted through out patient department. All patients were selected as per described criteria from the Department of Otolaryngology & Head-Neck Surgery, SSMCMH & BSMMU. Diagnosed the cases by detail history, clinical examination,investigations,analysed data presented by various tables, figures.

Results: In this study mean age of the patients of solitary thyroid nodule was 35.6±13.54 years and the highest frequency (38%) was within 21-30 years of age with female predominance (78%). Thyroid swelling was the common presentation in all9100%) cases, some patients also presented with other symptoms like cervical lymphadenopathy 13(13%) cases, dysphagia 1(1%), dyspnoea 1(1%), hoarseness of voice 1(1%) case & no bone metastetic found.

Keywords: *solitary thyroid nodule, papillary carcinoma, follicular carcinoma, medulary carcinoma.*

GJMR-J Classification: *NLMC Code: WK 200, WF 490*

Strictly as per the compliance and regulations of:

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Conclusion: In our series containing 18% malignancy in solitary thyroid nodule. So significant percentage of malignancy in STN is very important though it is a small noduler lesion. It is an important message to our fellows and practitioners to get appropriate medical attention for early diagnosis & proper management to reduce the morbidity and mortality.

Keywords: solitary thyroid nodule, papillary carcinoma, follicular carcinoma, medulary carcinoma.

I. Introduction

Thyroid gland and its enlargement are known since the time of Hippocrates. Among the endocrine organs, diseases of the thyroid gland are the most common. A good number of diseases affect the thyroid gland and almost all of them presents with nodular thyroid swelling. Nodular goiter remains a problem of enormous magnitude all over the world, although exact data on incidence and prevalence are unavailable. In our country the national prevalence rate is 10-15%, which indicates, the whole country is endemic. The endemicity varies from one place to another. The highest prevalence rate in Bangladesh is in the district of Rangpur and Jamalpur, the range varies from 21-30%. Nodular thyroid disease is more prevalent than diffuse goitre. In a report from the thyroid clinic, Bangabondhu Sheikh MujibMedical Univecity, Dhaka 32.67% of all thyroid patients had solitary nodules[1].

The solitary or isolated thyroid nodule may be defined as a discrete swelling in an otherwise impalpable gland. It is usually a benign lesion. It is common in clinical practice. The swelling is often noticed accidentally by the patient or drawn to her attention by a family member, neighbor, or a friend. The nodule may also be encountered as an incidental finding when a patient is examined for some unrelated disease. About 70% discrete thyroid swellings are clinically isolated. Thyroid nodules are common and are among 3-4% of the adult population in the UK and USA. They are 3-4 times more frequent in women than men. A nodule may be adenoma, cyst, multino-dular goiter, thyroiditis and thyroid cancer[2].

The importance of solitary thyroid nodule lies in the significant risk of malignancy compared with other

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thyroid swelling. Many studies have been published on the risk of malignancy in patients with thyroid nodules; these studies show that the risk of malignancy is low, approximately 5%, unless the patient has an underlying risk factor, such as a history of external neck irradiation[3]. If imaging investigations shows the nodule to be truly solitary, then the likelihood of it being malignant increases to about 5-20% [4], of which papillary carcinoma comprises about 80%, follicular carcinoma 10% and medullary carcinoma 5%[5], but in another study it showed papillary carcinoma comprises about 60% and follicular carcinoma 18%[6].

Screening of large numbers of patients previously unsuspected of having goiter suggests that the incidence of the isolated thyroid nodule in the general population may be of the order of 4-7%[7]. A thyroid nodule larger than 1 cm in diameter is usually palpable. However, the detection of a nodule by palpation also depends on its location within the thyroid gland, on the structure of the patient's neck and on the experience of the examiner.

It has been estimated that palpable thyroid nodules are present in 4-7% of the population, but when examined by ultrasound, as many as 50–70% of subjects with no history of thyroid disease have been found to have incidentally discovered thyroid nodules, many of which are not palpable[8]. In addition, nodular thyroid disease is more common in the elderly, a population subgroup, which is steadily increasing[9].

Laboratory investigations other than FNAC have limited role in finding out the nature of thyroid swelling. Isotope scan can demonstrate the functioning capacity of the nodule but cannot predict the histopathological character[10].

Fine needle aspiration cytology (FNAC) is considered as the most reliable test for the diagnosis of thyroid nodules [11]. Many investigators have tried to point out few ultrasonographic features in order to identify those lesions, which are at a higher risk of malignancy, especially in non-palpable thyroid nodules[12]. Pre-operative assessment of thyroid nodules is generally performed by radio- nuclide scanning and fine needle aspiration (FNA). FNA biopsy is described as the most preferred test that has improved selection of patients for thyroid surgery. Several studies have concluded that the risk of thyroid cancer is less with multiple nodules than with solitary nodules[13], [14] but other studies have not found any difference in risk[15]. It is becoming increasingly clear that high-resolution ultrasonography is better than physical examination9 or other imaging techniques[16] in detecting thyroid nodules.

This study has been carried out to find out the relative frequency of pathological types, incidence of malignancy in solitary thyroid nodule and its age & sex variation. This study also carried out to review the existing protocol for the management of solitary thyroid nodules in our country and to assess the accuracy of the available diagnostic modalities for appropriate selection of patients

II. Methods

This cross-sectional study was carried out with 100 solitary thyroid nodular patients who admitted in Otolaryngology & Head-Neck surgery ward of Sir Salimullah Medical CollegeMitford Hospital & BSMMU, Dhaka, from July 2011 to December 2012. All patients were admitted from Out Patient Department. A detailed history was taken (including family history & history of exposure of radiation) and thorough physical examinations including general examinations, examinations of ear, nose, throat, thyroid gland, neck, hand signs, eye signs and systemic examinations were carried out. All patients were analyzed in various aspects like age, sex, occupation, mode of presentation. Routine investigations like Blood, Urine, CXR, and ECG were done. Special investigations like thyroid function test- serum T3, T4, TSH done. To detect single or multiple nodules, solid or cystic condition of nodules-USG of thyroid gland done.Preoperative FNAC of thyroid gland done to detect benign or malignant condition. X-ray neck both view done to see retrosternal extension of gland, position of trachea, patency of airway.

Thyroid scan done to see functional status of gland like cold, warm & hot nodule. FNAC findings were recorded & then after surgery histopathology reports were recorded & FNAC findings were compared with histopathological reports. Data were processed and analyzed by using computer based programmed SPSS-16 (Statistical Package for Social Sciences). The quantitative data were analyzed by mean, standard deviation. The qualitative data were analyzed by Pearson Chi-square(x^2) test with 95% confidence interval to make inference.

III. Results

Table 1 : Age distribution of the study subjects (n=100)

Age group(Years)	Frequency	Percentage
10-20	08	08.0
21-30	38	38.0
31-40	28	28.0
41-50	14	14.0
51-60	06	06.0
>60	06	06.0
Total	100	100.0

Mean(±SD)age=35.60(±13.54)yrs, 13 -75 yrs

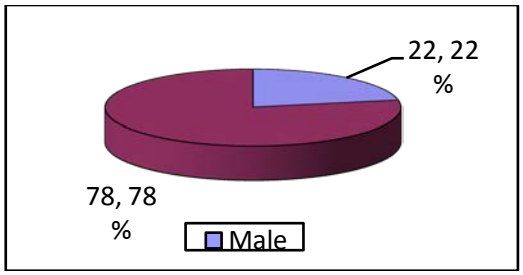

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Figure 1 : Sex distribution of the study subjects (n=100)

Table 2 : Occupational status of the study subjects (n=100)

Occupation	Frequency	Percentage
Service	14	14.0
Business	02	02.0
Housewife	68	68.0
Others	16	16.0
Total	100	100.0

Table 3 : Sex distribution in carcinoma in solitary thyroid nodule (n=100)

Histopathological findings	Sex			
	Total	Male	Female	P value
Malignant	18(18)	06(27.3)	12(15.4)	0.21
Benign	82(82)	16(72.7)	66(84.6)	
Total	100(100)	22(100)	78(100)	

X^2-0.94 *Values in parentheses are percentages*

Table 4 : Clinical presentation of cases of solitary thyroid nodule

Sign and symptoms	Frequency	Percentage
Swelling in front of neck	100	100
Palpable cervical lymph nodes	13	13
Dysphagia	01	01
Dyspnoea	01	01
Hoarseness of voice	01	01
Bone pain	00	00

Table 5 : Involvement of site of solitary nodule in the thyroid gland

Site	Frequency	Percentage
Right lobe	56	56.0
Left lobe	38	38.0
Both lobe	04	04.0
Isthmus with adjacent lobe	02	02.0
Total	100	100.0

Table 6 : Distribution of cases according to the histopathology report & the time elapsed after the nodule has developed

Duration of nodule development	Histopathological findings		Total	P value
	Benign n (%)	Malignant n (%)		
< 1 yr	10(12.19)	06(33.33)	16(16)	0.01^S
1-2 yrs	14(17.07)	10(55.56)	24(24)	
2-5 yrs	34(41.46)	02(11.11)	36(36)	
> 5 yrs	24(29.26)	00(00)	24(24)	
Total	82(100)	18(100)	100(100)	

χ2 = 11.14, Values in parentheses are percentages

Table 7 : Relation of thyroid scans with histopathological findings

Histopathological study	Thyroid scan	
	Cold	Warm
Benign	78(81.25)	4(100)
Malignant	18(18.75)	00(00)
Total	96(100)	4(100)

Values in parentheses are percentage

Table 8 : Association of histopathological findings with the consistency of STN

Consistency	Histopathological findings Benign n(%)	Malignant n(%)	Total	χ^2 (P value)
Soft	08(9.75)	00(00)	08(08)	0.81(0.37^{ns})
Cystic	10(12.19)	01(5.55)	11(11)	0.16(0.34^{ns})
Firm	62(75.61)	13(72.22)	75(75)	0.04(0.99^{ns})
Hard	02(2.43)	04(22.22)	06(06)	8.26(0.009^{S})
Total	82(100)	18(100)	100(100)	

Chi-square test

Table 9 : Fine needle aspiration cytological variations of solitary thyroid nodules

Diagnosis		Number	Percentage
Non neoplastic	Colloid nodule	46	46
	Thyroiditis	02	02
	Colloid degeneration	6	6
	Cellular Follicular lesion	30	30
Neoplastic	Papillary carcinoma	13	13
	Medullary carcinoma	01	01
	Suspicious	02	02
Total		100	100

Table 10 : Histopathological variations of solitary thyroid nodules

Diagnosis			Number	Percentage
Non neoplastic	Nodular goiter		54	54
	Thyroiditis		02	02
Neoplastic	Benign	Follicular adenoma	26	26
	Malignant	Papillary carcinoma	15	15
		Follicular carcinoma	02	02
		Medullary carcinoma	01	01
Total			100	100

Table 11 : Results of FNAC & corresponding final histopathology

FNAC findings	Total	Final histopathological findings Benign	Malignant	P value
Malignant cell Absent	84(84)	80(97.56)	04(22.22)	
Malignant cell present	16(16)	02(2.43)	14(88.88)	$<0.001^{S}$
Total	100(100)	82(100)	18(100)	

$\chi 2 = 56.85$, Values in parentheses are percentages.

Table 12 : Histopathological findings of the study subjects. (n=100)

Histopathological findings	Frequency	Percent
Benign	82	82.0
Malignant	18	18.0
Total	100	100.0

Table 13 : Pattern of malignancy in solitary thyroid nodule according to histopathology

Type of malignancy	No of cases	Percent
Papillary carcinoma	15	83.33
Follicular carcinoma	02	11.11
Medullary carcinoma	01	5.55
Total	18	100

Table 14 : Distrbution of final benign & malignant lesion in according to preoperative solid & cystic findings

Histopathological findings	USG findings		Total	P value
	Cystic	Solid		
Malignant	01(09.1)	17(19.10)	18(18)	<0.001[S]
Benign	10(90.9)	72(80.89)	82(82)	
Total	11(100)	89(100)	100(100)	

$\chi 2$ = 23.92, Values in parentheses are percentages

IV. Discussion

This cross sectional study was done in the department of Otolaryngology & Head-Neck surgery, Sir Salimullah Medical College Mitford Hospital and BSMMU, Dhaka from July 2011 to December 2012. For this study, 100 patients of STN were studied by detailed history, clinical examination, thyroid hormone assay, ultrasonogram, thyroid scan, FNAC and histopathological examinations.

In our study mean age of the patients of solitary thyroid nodule was 35.6±13.54 years and the highest frequency (38%) was within 21-30 years of age. Whereas in the study of Islam et al. 2009, showed the majority of the patients were within 21-40 yrs of age. In a study17 they found the age range of their patients were 11-70 years of age. The youngest patient in our study was a boy of 13 years with a papillary carcinoma and the oldest patients was a man of 75 years with medullary carcinoma. The youngest patient and oldest patients of this study both had been suffering from malignant thyroid disease, the extreme of ages show less incidence of thyroid disease but has a more chance to be malignant.

In this series, out of 100 patients, male were 22 (22%) and female were 78 (78%). Male female ratio was 1: 3.54. In a study[17] solitary thyroid nodules were more common in female, where male female ratio was 1:2.2. This female preponderance is reflected in all studies including the present. The cause of high male to female ratio in this series can be explained by most of the patients are from nonendemic area [18]. Here we may recall the findings of Kilopatric et al. who found a female to male ratio of 4:1 in nonendemic area[19]. It is due to fact that thyroid disorder is female prone owing to the presence of estrogen receptors in the thyroid tissue[6]. In this study the commonest occupational group was house wife (68%).

All solitary nodules are not a single clinical entity. So it is very difficult to comments regarding the nature of solitary nodule purely on the basis of clinical ground. But hoarseness of voice, hard irregular nodule, palpable cervical lymph node, extreme of age, male sex are always suspicious for malignancy in solitary thyroid nodule[20]. Regarding presenting complaints we have found that all of the patients with neck swelling presents within variable durations. Some patient also presented with other symptoms like cervical lymphadenopathy 13(13%) cases, dysphagia 1(1%), dyspnoea 1(1%), hoarseness of voice 1(1%) case & no bone metastetic found. Among 18 malignant cases 10(55.56%) cases presented within 2 years but out of 82 benign cases only 14(17.07%) cases presented within 2 years. It is well supported by others studies[21,22].Where duration of swelling prior to the presentation was from 6 months to 3 yrs[17].Nodular goiter with large swelling may be associated with difficulty in respiration or rarely in deglutition which is due to pressure on trachea or oesophagus[23].

In this series we have seen that nodules were found more in right lobe than left. There is yet no reported predilection for any specific site and no reason has been put forward for such a predilection. Similar findings were noted by many authors[24,25].We found 56 nodules in right lobe, 38 nodules in left lobe, 4 nodules in both lobes and 2 nodules in the junctional region between isthmus and one lobe.

Firm nodules are the commonest form of solitary thyroid nodule. In this series of solitary thyroid nodules constituted 73% firm, 6% hard and 11% cystic. Malignancy was found more in firm nodule 13(72.22%). Islam et al. 2009, found majority of the nodules were firm (72.03%), others were hard(16.95%) and cystic (11.02%). Malignant lesion was more common in hard nodule (70%).) Here hardness of nodule was due to malignancy and inflammatory conditions. Among 6 hard nodules, 4 were diagnosed as malignancy and 2 were diagnosed histopatho -logically as thyroiditis. So hardness in not conclusive but an important indication for malignancy. Hardness and irregularity, due to calcification, may simulate carcinoma[6].

Investigations are essential to establish preoperative physical, function status and cytopathological nature of solitary nodule of thyroid[26].

All patients of this study have done thyroid hormone profile and show value within normal limit. Isotopes scanning of the thyroid gland were done to see the functional status of the nodule. We found most 96(96%) of the nodules were cold & 4(4%) were warm nodule & no hot nodule found. In our study out of 96 cold nodular goiters we found 18(18.75 %) malignant & no malignant case found from rest of 4 warm cases. In a study showed that on thyroid scan out of 40 patients (80%) having cold nodule &10 patients (20%) had hot nodule[27]. Most of the nodules were cold (66.10%) among them 25.6% cases were malignant, followed by warm (30.5%) and hot (3.3%)[28].

Fine needle aspiration cytology (FNAC) is a very important, highly sensitive and minimally invasive preoperative diagnostic tool[23]. According to a study FNAC is a gold standard for preoperative assessment of thyroid nodules. Early and accurate diagnosis reduces surgical intervention, morbidity and mortality[29]. In our study of FNAC of STN we found colloid nodule 46%, throiditis 2%, colloid degeneration 6%, cellular follicular lesion 30%, papillary carcinoma 13%, medullary carcinoma 1% & non conclusive 2%. On FNAC majority of STN were benign with being more common17. FNAC cannot distinguish between follicular adenoma and follicular carcinoma. In our study sensitivity & specificity of FNAC was 77.77% & 97% respectively. Where other study showed sensitivity and specificity of FNAC was 90% and 100%, respectively[29]. Basharat R etal. 2011, showed sensitivity & specificity of FNAC 80% & 97.7% respectively in her study. So FNAC is an important pre-operative diagnostic tool for STN.

Final diagnosis in this study was on the basis of histopathological reports record. Out of 100 cases, 54 cases (54%) were proven as nodular goitre & 2 % were thyroiditis in non-neoplastic lesion & in neoplastic lesion we found 26(26%) was benign (follicular adenoma) and 18(18%) cases were malignant. In our study among 18 malignant cases 15(83.33%) were papillary carcinoma, 2(11.11%) were follicular carcinoma and 1(5.55%) case was medullary carcinoma. In a study 13.9% of patients of STN was found to be malignant[30]. A study showed that 13.33% of STN were found to have malignant lesions & 86.67% were benign[31]. Papillary carcinoma was the most common malignancy (50%) found in his study. Male patients with solitary thyroid nodule showed a higher incidence of malignancy (17.65%) as compared to females (11.63%). In our study we found frequency of malignancy in case of male was 27.3% & in case of female 15.4 %. Venkatachalapathy et al. 2012, found the incidence of malignancy in their series in STN was 18%. Islam et al. 2009, in their study found 18.65% of STN to be malignant & out of them 16 (72.72%) cases were papillary carcinoma, 4 (18.18%) cases were follicular carcinoma and 2(9.1%) cases were medullary carcinoma. It showed a clear predominance of papillary over follicular and medullary carcinoma. According to Watkinson (2000), frequency of papillary carcinoma is 80% and follicular carcinoma is 10%. Some study showed that papillary carcinoma comprises about 60% of all thyroid cancer[32] and follicular carcinoma comprises 18% of all malignant thyroid neoplasm[6]. So, papillary carcinoma was more common among all thyroid malignancies in patients with solitary thyroid nodule. Ultrasonography is used to establish physical characteristics of nodule like the size, echo-structure (solid or cystic), shape and number of nodule(s), and extranodular thyroid tissue. In our study of ultrason-ography we found 89(89%) nodules were solid, 11(11%) were cystic. In our study, out of 89 solid nodule 72(80.89%) were benign & 17(19.10%) nodule were malignant and out of 11 cystic nodule 10(90.9%) were benign & 1 (9.1%) was malignant. In our study, most of the benign & malignant nodules were predominantly solid. Study showed the malignancy is significantly ($p<0.001$) more in solid than cystic solitary thyroid nodule. Our study correspond with a study where he showed of cystic thyroid lesions, 4% were simple cysts, 82% were degenerating benign adenomas or colloid nodules and 14% were malignant compared with 23% of solid lesions that were malignant[33]. Cathy Crenshaw Doheny also mentioned In a web journal found that a solid thyroid nodule is more likely than a cystic nodule to be malignant[34]. More than 90% of all solid nodules, however, are benign. A study showed 9% incidence of malignancy in solid nodules & no malignancy in cystic nodules[35]. Whereas other found incidence of carcin-oma in cystic lesion $<2\%$[36].

As this study had been carried out over a limited period of time with a limited number of patients, it could not have been large enough to be of reasonable precision. All the facts and figures mentioned here may considerably vary from those of large series covering wide range of time, but still then, as the cases of this study were collected from tertiary level hospitals in our country, this study had some credentials in reflecting the facts regarding distribution and type of malignancy in solitary thyroid nodules.

V. Conclusion

We have observed worldwide malignancy in STN ranging from 16-30%[37]. We found in our series containing 18% malignancy in solitary thyroid nodule. So significant percentage of malignancy in STN is very important though it is a small nodular lesion. As small lesion of STN sometimes is overlooked so it is an important message to our fellows and practitioners to get appropriate medical attention for early diagnosis & proper management to reduce the morbidity and mortality.

References Références Referencias

1. Ala Uddin M & Joarder AH (2003). Management of thyroid carcinoma. Bangladesh J of otorhipnol-aryngolgy; 9(1/2): 23-37.
2. Thomas V, McCaffrey (2000).Evaluation of thyroid nodule. Cancer Control; 7: 223-228.
3. Wienke JR, Chong WK, Fielding JR, Zou KH, Mittelstaedt CA (2003). Sonographic features of benign thyroid nodules: interobserver reliability and overlap with malignancy. J Ultrasound Med; 22:1027–1031.
4. Belfiore A, Giuffrida D, La Rosa GL, et al (1968). High frequency of cancer in cold thyroid nodules occurring at young age. Acta Endocrinol. (Copenh); 121: 197- 202.
5. Watkinson JC, Gaze MN, Wilson JA (2000).Tumors of the thyroid and parathyroid gland. Stell and Maran's Head Neck Surgery, 4th edn., Butterworth Heinemann: 458-484.
6. Krukowski ZH (2004). The thyroid gland and thyroglossal tract, Baily & Love's short practice of surgery. 24th ed. London. Hodder education, 776-804.
7. Vander JB, Gaston EA, Dawber TR (1968). The significance of nontoxic thyroid nodules: final report of a 15-year study of the incidence of thyroid malignancy. Ann. Intern. Med; 69: 537 -540.
8. Papini E, Guglielmi R, Bianchini A, Crescenzi A, Taccagna S, Nardi F, Panuzzi C, Rinaldi R, Toscano V, Pacella C(2002). Risk of malignancy in nonpalpable thyroid nodules: predictive value of ultrasound and color-doppler features. Journal of Clinical Endocrinology and Metabolism; 87: 1941–1946.
9. Gharib H, James EM, Charboneau JW, Naessens JM, Offord KP, Gorman CA(1987). Suppressive therapy with levothyroxine for solitary thyroid nodules: a double blind controlled clinical study. N Engl J Med.; 317: 70-75.
10. Sattar MA, Alam MM, Haider A (2003). Clinicopathological study of solitary cold thyroid nodule. Bangladesh JOtolaryngol; 9(1/2): 24-27.
11. Lyshchik A, Higashi T, Asato R, Tanaka S, Ito J, Mai JJ, Pellot- Barakat C, Insana MF, Brill AB, Saga T, Hiraoka M ,Togashi KL(2005). Thyroid gland tumor diagnosis at US Elastography. Radiology; 237: 202–211.
12. Kang HW, No H, Chung JH, Min YK, Lee MS, Lee MK, Yang JH, Kim KW(2004). Prevalence, clinical and ultrasonographic characteristics of thyroid incidentalomas. Thyroid ; 14: 29–33.
13. Brown CL (1981). Pathology of the cold nodule. Clin Endocrinol Metab; 10: 235- 245.
14. Cole WH (1991). Incidence of carcinoma of the thyroid in nodular goiter. Semin Surg Oncol; 7: 61-63.
15. Belfiore A, La Rosa GL, La Porta GA et al. (1992). Cancer risk in patients with cold thyroid nodules: relevance of iodine intake, sex, age, and multinodularity. Am J Med.; 93: 363-369.
16. Solbiati L, Volterrani L, Rizzatto G, et al (1985). The thyroid gland with low uptake lesions: evaluation by ultrasound. Radiology; 155: 187-191.
17. Venkatachalapathy T S ,Sreeramulu P N, Prathima S, Kumar K(2012).A prospective study of clinical, sonological & pathological evaluation of thyroid nodule. J Biosci Tech; 3 (1), 474- 478.
18. Inder JC, David HS (1997). Thyroid function test and there alteration by drugs. The thyroid nodules clinical nuclear medicine; 2(9):324-333.
19. Ashraf SA, Matin ASM (1996). A Review of thyroid diseases in Bangladesh. Journal of BCPS. 2(1): 6-10.
20. Rains AJH, Charles VM (2004). Bailey and Love's short practice of surgery, twenty third ed. London, ELBS :707-733.
21. Cady B, Sedgewick CE, Meissner WA, (1979). Risk factor analysis in differentiated thyroid cancer. AMJ. Surg, 136; 107-112.
22. 22.Harmo J, Clark OH (1979). Significance of lymph node metastasis in differentiated thyroid cancer. Cancer; 10(6):230-37.
23. Stark DD, Clark OH, Gooding GAW, Moss AA (1983). High-resolution ultrasonography and computed tomography of thyroid lesions in patients with hyperparathyroidism. Surgery; 94.
24. Messaris G, Kyriakov K, Vasilopoulos P, and Tountas C (1974). The single thyroid nodule and carcinoma.Br J Surg, 61, 943.
25. Gupta M, Gupta S, Gupta V. Correlation of fine needle aspiration cytology with histopathology in the diagnosis of solitary thyroid nodule. J Thyroid Res 2010, 2010, 379051
26. Dudley H, Pories WJ (1986). General Principles, Breast and Extracranial endocrines in Rob and Smith's Operative Surgery. 4th edn. London. Butterworth Scientific:332-386.
27. Basharat R,Hussain M, Saeed S, Hamid T(2011). Comparison of Fine Needle Aspiration Cytology and Thyroid Scan in Solitary Thyroid Nodule. SAGE-Hindawi Access to Research Pathology Research

International Volume 2011, Article ID 754041, 9 pages doi:10.4061/2011/754041
28. Islam R, Ekramuddaula AFM, Alam MS , Kabir MS , Hossain D, Alauddin M(2009). Frequency & pattern of malignancy in solitary thyroid nodule. Bangladesh J of Otorhinolaryngology; 15(1): 1-5
29. Chandanwale S et al. (2012). Research article: Clinicopathololological correlation of thyroid nodules. Int J Pharm Biomed Sci; 3(3), 97-102
30. Khairy GA (2004).Solitary thyroid nodule:the risk of cancer & the extent of surgical therapy.East african medical journal;81(9),459-461.
31. Tarrar AM, Khan OU, Walah MS, Waqas A, Ilyas S, Raza A(2010).Solitary thyroid nodule. Professional Med J; 17(4): 598-602.
32. Shaheen OH (1997). The thyroid gland. In: Kerr AG ed. Scott-Brown's oto largyngology. 6th Ed vol-5. London, Butter worth Heinemann : 5/18/1-5/18/22.
33. Edith T. de los Santos, MD; Sedigheh Keyhani-Rofagha, MD; Jerome J. Cunningham, MD; Ernest L. Mazzaferri, MD(1990). Cystic Thyroid NodulesThe Dilemma of Malignant Lesions. Arch Intern Med.; 150(7):1422-1427
34. Dohney CC (2012). Clear answers for common questions of thyroid nodule available from http://www.wiseGEEK Thyroid nodule.com,accessed 10 August,2012.
35. Raza S, Raza H, Zahid Z (2006). FNAC in management of solitary thyroid nodule. Professional Med J; 13: 596.
36. Ergete W, Abebe D(2002). Discordance rate between thyroid FNAC &histopathology diagnosis. Ethiopian J Health Dev.; 16: 227.
37. Abdullah M (2002). Thyroid cancer: The Kuala Lumpur experience. ANZ J Surg; 72:660-4.

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Gingival Diseases in Childhood- A Review

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Abstract- Children are exposed to various gingival diseases, similar to those found in adults, yet differ in some aspects. These diseases could be plaque or non-plaque induced, familial, or may be associated with a systemic condition. It is crucial to diagnose and manage gingival diseases as early as possible as they have the potential to further progress, causing a severe breakdown of periodontal support. Consequently, the final result may lead to tooth loss at an early age, which in turn will affect the nutrition and overall development of a pediatric patient. Therefore, greater emphasis is given to the prevention, early diagnosis, and treatment of gingival disease in children. As a dentist, it is necessary to be able to distinguish and differentiate all possible gingival conditions to successfully manage them. By establishing excellent oral hygiene habits in children, which will carry over to adulthood, the risk of periodontal disease is lowered. This paper will review various gingival conditions that are found in children, their main clinical features and management.

Keywords: gingival diseases in children, plaque induced gingivitis, non-plaque induced gingivitis, early diagnosis, pediatric gingivitis.

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Abstract- Children are exposed to various gingival diseases, similar to those found in adults, yet differ in some aspects. These diseases could be plaque or non-plaque induced, familial, or may be associated with a systemic condition. It is crucial to diagnose and manage gingival diseases as early as possible as they have the potential to further progress, causing a severe breakdown of periodontal support. Consequently, the final result may lead to tooth loss at an early age, which in turn will affect the nutrition and overall development of a pediatric patient. Therefore, greater emphasis is given to the prevention, early diagnosis, and treatment of gingival disease in children. As a dentist, it is necessary to be able to distinguish and differentiate all possible gingival conditions to successfully manage them. By establishing excellent oral hygiene habits in children, which will carry over to adulthood, the risk of periodontal disease is lowered. This paper will review various gingival conditions that are found in children, their main clinical features and management.

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I. Introduction

Periodontal disease may have its origins in childhood. Studies confirm a high prevalence of gingival inflammation in children, which may progress to periodontitis, resulting in the loss of primary and permanent teeth. Therefore, promptly diagnosing and treating gingival diseases in childhood may reduce the risk of carrying forward the disease in adulthood. Gingival diseases affecting children may be broadly classified into Dental Plaque- induced and Non-plaque-induced gingival diseases (table 1).[1]

Table 1 : Gingival Diseases: Classification

Table1- Gingival Diseases: Classification

Dental Plaque-induced Gingival Diseases	Non-plaque-induced Gingival Diseases
A. Gingivitis Associated with Dental Plaque Only *I. **Without local contributing factors:*** • Chronic gingivitis • Plaque-Induced gingival enlargement *II. **With local contributing factors:*** • Eruption gingivitis • Mouth breathing • Crowding gingivitis • Gingival Changes Related to Orthodontic Appliances	**A. Gingival diseases of Viral origin** • Primary Herpetic Gingivostomatitis **B. Gingival diseases of Fungal origin** • Acute Candidiasis (Thrush, Candidosis, Moniliasis) • Linear gingival erythema **C. Gingival diseases of Bacterial origin** • Acute necrotizing ulcerative gingivitis (ANUG) • Streptococcal infection (Catarrhal gingivitis) **D. Congenital gingival Anomalies** • Congenital gum synechiae • Congenital epulis

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B. Gingival Diseases Modified by Systemic Factors

I. Associated with the endocrine system:

- Puberty gingivitis
- Diabetes Mellitus associated gingivitis

II. Associated with blood dyscrasias:

- Leukemia associated gingivitis
- Others

III. Associated with nutritional deficiency:

- Ascorbic Acid Deficiency Gingivitis

C. Modified by medications

I. Drug-induced gingival enlargement

E. Traumatic Gingival Lesions

- Factitious gingivitis
- Accidental
- Iatrogenic

F. Gingival lesions of genetic origin

- Hereditary gingival fibromatosis

G. Foreign body reaction

- Amalgam tattoo

H. Gingival manifestations of systemic conditions (rare)

- Pemphigus vulgaris
- Kindler syndrome
- Lichen planus
- Allergic reaction
- Wegener's Granulomatosis

I. Gingival Abscess

Modified from Armitage GC: Development of a classification system for periodontal diseases and conditions, *Ann Periodontol* 4:1, 1999

Gingiva of children is different in many aspects. Gingiva of the primary dentition generally appears as pale pink, but less pale than that of an adult.[2] The marginal gingival is also more vascular and contains fewer connective tissue cells.[3] The thinner, more red appearingepithelium with a lesser degree of keratinization may be interpreted as mild inflammation.[3] The width of attached gingiva is less variable in the primary dentition, causing fewer mucogingival problems[3]; however, the width increases with age.[4] Stippling in children usually appears at about 3 years of age without significant inter-arch difference.[5] Interdental papilla is broad bucco-lingually and narrow mesio-distally.[6] The junctional epithelium tends to be thicker of the primary dentition than the permanent.[7]Gingival sulcular depth ranges from 1-2 mm which is shallowerthan that found in adults.[8]

There are normal physiological changes associated with tooth eruption that may appear as agingival pathology and must be distinguished. The gingival prominence caused by the crown of an underlying erupting tooth is firm and pink, with mild inflammation from mastication; however an eruption cyst will presents as a bluish or deep red enlargement of the gingiva over the erupting tooth[6]. The gingival margin of a newly erupted tooth appears rounded, edematous and reddened and may mimic gingivitis. This paper will present various dental plaque and non-plaque induced gingival diseases affecting children and adolescents.

II. Dental Plaque-Induced Gingival Diseases

Chronic gingivitis is common in children and adolescents, where inflammation is generally limited to the marginal gingiva with undetectable loss of bone or connective tissue attachment[6]. The primary cause is dental plaque related to poor oral hygiene.[6]Clinical features include red linear inflammation, increased vascularization, swelling, and hyperplasia[9]. Bleeding and increased pocket depth are found less frequently in children than in adults, but may be observed in severe gingival hypertrophy or hyperplasia.[9] Calculus deposits are rarely seen in infants but may increase with age[6]; however, children with cystic fibrosis have higher incidences of calculus, which may be caused by increased salivary calcium and phosphate concentrations[10].

Plaque control procedures[11] in the primary dentition can be accomplished by rubber-cup coronal polishing (if no calculus is evident) or by selective supra-gingival scaling (if calculus is evident); however as permanent teeth erupts, additiontargeted sub-gingival scaling may also be necessary. Oral hygiene measures should be instructed to parents and children in terms that both understand. The dynamic process of developing manual dexterity impacts the ability of a child to perform expected procedures. Children are encouraged to use a simple scrub technique; more

refined brushing techniques can be introduced during adolescence. Flossing should be added to the home care routine as interdental contacts develop, and is usually not indicated in the primary dentition stage. Antimicrobial mouth rinses for chemical plaque control are not indicated in very young children because of the risk of ingestion.

Plaque induced gingival enlargement- occursdue to prolonged plaque exposure which may be complicated by local factors like mouth breathing, or orthodontic appliances.[12] Clinically, it ranges from pale and fibrotic to red and friable.[12] There is localized or generalized enlargement of the interdental papilla and/or gingival margin.[12] Meticulous plaque control is required, and sometimes, gingivectomy or gingivoplasty may be indicated.[12]

Eruption gingivitisis a temporary type of gingivitis seen in young children during teeth eruption.[13] Tooth eruption itself does not cause gingivitis; infact it is the inflammation associated with plaque accumulation around erupting teeth is common[7]. Eruption gingivitis is usually mild which requires no treatment other than improved oral hygiene.[13]

Mouth breathingand lip incompetence may result in increased plaque and gingival inflammation which is often limited to the gingiva of the maxillary incisors due to frequent drying out of the gingiva.[11, 14] Treating the cause of mouth-breathing may resolve the problem for example gingivitis secondary to mouth breathing caused by allergic rhinitis can be treated by antihistamines[6] and incompetent lips can be corrected by orthodontic treatment.

Crowding gingivitisis due to irregular arrangement of the dentition, preventing self-cleansing of the mouth. It is worse in children who do not brush their teeth regularly. Oral hygiene instructions and orthodontic treatment can alleviate the gingivitis.[11]

Gingival changes due to orthodontic appliances can occur within 1 to 2 months of appliance placement due to difficult plaque removal.[11] Changes are generally transient, rarely producing long-term damage to periodontal tissues.[11] Use of special toothbrushes (e.g. powered tooth brushes) and additional cleaning tools may be recommended for better plaque control[15].

Pubertal gingivitispeaks at 9 to 14 years of age and generally subsides after puberty.[7] Hormonal changes during puberty accentuates the vascular and inflammatory response to dental plaque[9] and also alters reactions of plaque-microbes[16] that could explain this modified gingival response. Frequently, it presents as enlargement, bleeding and inflammation in interproximal areas without concomitant increase in plaque levels affecting both males and females.[17] It generally subsides after puberty however severe cases are treated by improving oral hygiene[13], removing all local irritants[13], restoration of carious teeth[13] and improving nutritional status (e.g. administration of 500mg of ascorbic acid orally for 4 weeks[19]).

Diabetes mellitusType 1 occurs more frequently in children and adolescents than Type [2]. Gingival inflammation and periodontitis are more prevalent and severe in affected children with poor metabolic control than in unaffected individuals.[20] Premature tooth loss and impaired immune response to oral flora occurs in severe cases. Treatment includes- controlling diabetes, disease prevention[21] and early training and motivation of children to maintain efficient plaque control21, [22].

Leukemiais the most common type of cancer in children, and acute lymphoblastic leukemia is the commonest amongst them. It is accompanied by oral symptoms that include acute gingival enlargement, ulceration, bleeding and infection.[23] These patients have low tissue-resistance to infection, owing to decreased circulating leukocyte count, which is further complicated by cytotoxic drugs (interfere with epithelial cell replication) that are used in the treatment of leukemia. Therefore, rigorous plaque control measures must be implicated both before commencing cytotoxic treatment and during medical treatment.[22,24]

Gingivitis associated with vitamin C deficiencycan lead to edematous and spongy gingiva, spontaneous bleeding, and impaired wound healing.[12]The underlying deficiency must be corrected, along with plaque control.[12]

Drug-induced gingival enlargementcan occur in children taking anticonvulsants (phenytoin,[25,26] valproate[26]), calcium channel blockers (nifedipine[26], diltiazem[26], verapamil[26]), and immunosuppressives (cyclosporine A[27]). Although complicated by increased plaque along the gingival margin, t features of this condition differ from that of chronic marginal gingivitis.[9] The clinical features are very similar irrespective of the drug involved. The first signs of change usually appears 3 to 4 months after drug administration. Enlargement appearsmulberry-shaped, pink, firm and stippled in patients with good hygiene, however, in subjects with pre-exiting gingivitis, or a poor standard of plaque control, the enlarged tissues shows classical signs of gingivitis[3]. To manage such enlargement, strict oral hygiene instructions and scaling must be implemented.[3] Severe cases inevitably need to be surgically excised and re-contoured (gingivectomy and flap surgery).[3] A follow-up program is essential to monitor plaque control and to detect any recurrence, in which case drug modification may be needed.[3]

III. Non-Plaque Induced Gingival Diseases

Primary herpaticgingivostomatitis is an acute infectious disease of the gingiva caused by herpessimplex viruses (HSV) Type-1 most commonly affecting children between 2-5 years of age.28Clinical features include febrile illness, headache, malaise, oral pain, mild dysphagia, and cervical lymphade-nopathy [3,9,13,28,29]. Gingivitis is the most striking feature, with markedly swollen, erythematous, friable gums[3,13,29] The

goal of treatment isto make the patient comfortable, and to prevent secondary infections or worsening systemic illness. Supportive management involves bed rest, eating a soft diet, and maintaining adequate hydration and treating pyrexia using paracetamol suspension.[3,29] Secondary infection of ulcers is prevented using chlorhexidine.[3] Systemic treatment includes antivirals (acyclovir) and analgesics (acetaminophen). Topical anesthetics may also be used; however, do not speed healing.[3,13,29]

Candidiasisis caused by candida albicans following a course of antibiotics or as a result of congenital or acquired immunodeficiences. In neonates, infection can be contracted during passage through vagina. It is less common in children and is rarely associated with a healthy child.[30] It presents as raised, furry, white patches, which if removed leaves bleeding underlying surface.[13] Infants can be treated topically by a suspension of 1mL (100,000 U) of nystatin 4 times a day. Older children can be treated using clotrimazole troches or nytatin pastilles. Severe cases can be managed by systemic fluconazole (infants-suspension 6mg/kg or less per day; older children- 100mg tablet for 14 days).[13] Catarrhal gingivitis (streptococcal gingivitis)is caused by hemolytic streptococcus. Clinical features include fever, headache, myalgia, and arthralgia[31]. The gingiva is painful, appears red, soft and friable, and tend to bleed spontaneously. Improved oral hygiene, mouthwashes and antibiotics are recommended for treatment.[31].

Acute necrotizing ulcerative gingivitis (ANUG) is a broad anaerobic infection caused by fusiform bacteria, spirochetes, and other gram-negative anaerobic organisms.[3.29,32] Malnutrition, stress, lack of sleep are few predisposing factors.[29,32] It is common in young children in less-developed countries. ANUG is rapid in onset and very painful. “Punched out” ulceration and necrosis occur in the interdental papillae and marginal gingival, covered by yellowish-grey pseudo-membranous slough.[3] Eventually, involve the alveolar crest and may progress to necrotizing ulcerative periodontitis in immuno-compromised individuals as recurrence is inevitable. Treatment include intense oral hygiene, professional plaque removal, mouthwash rinse (0.5% hydrogen peroxide -removal of necrotic tissues and 0.2% chlorhexidine- prevents plaque formation), antibiotics (penicillin or metronidazole), and NSAIDs for pain.[33]

Congenital epulisis a rare gingival tumor that occurs along the alveolar ridge in newborns, without additional congenital malformations or associated teeth abnormalities. Clinically presents as a smooth, well-defined erythematousmass arising from gum pad. Small lesions may regress and larger lesions must be resected, as they often interfere with airway and cause feeding difficulties. The un-erupted teeth are not affected usually.[34]

Congenital gum synechiaepresents as unilateral or bilateral adhesions between the maxilla and mandible in the form of fibrous bands that makes feeding, swallowing and respiration difficult soon after birth. Early treatment is recommended which involves excision of alveolar bands. If not treated, it may result in TMJ ankylosis, restricted jaw growth and overall growth may also be affected (restricted feeding).

Traumatic lesionscan be factitious, iatrogenic or accidental and can occur as a result of chemical physical or thermal injury.[37] Toothbrush abrasion due to faulty brushing technique is very common which presents as painful ulceration with surrounding erythematous halo. These may usually get superinfected by normal mixed flora of oral cavity when these ulcers may get covered with yellowish exudates.[33] Initial professional cleaning followed by cessation of tooth-brushing for 7-10 days is recommended, during which child should rinse 2 times daily with 0.1% chlorhexidine.[33] The right brushing technique must also be taught to the child.

Factitious gingivitis (Gingivitis artefacta) is a self-inflicting physical injury of gingiva that could be habitual, accidental or psychological in origin.[3], 38The minor form is caused by rubbing or picking of the gingival with fingernail or abrasive foods while, the major form is more severe and widespread, involving deeper periodontal tissues.[3] Other areas of the mouth may be involved, as well as extra-oral injuries found on the scalp, face or limbs. Management includes removal of irritation source, habit correction, and wound dressings.[3,38] In major cases, psychological or psychiatric consultation may be advised.[3,38] Hereditary gingival fibromatosis is a rare overgrowth usually transmitted as dominant trait[40]. Enlarged gingival tissues are usually normal, pink, firm and leathery with little inflammation and involves attached, interdental and marginal gingiva.[39,40,41] There may be esthetic or functional problems, such as mal-positioning of teeth, prolonged retention of primaryteeth and delayed eruption of permanent successors.[41] In addition, the hyperplastic regionproduces conditions favorable for accumulation of dental plaque causing secondary-inflammatory changes.[41] Treatment include removal of hyperplastic tissues by conventional gingivectomy.[42]

Strawberrygingivitisis gingival manifestation of Wegener’s Granulomatosis, a necrotizing granulo-matous vasculitis affecting upper and lower respiratory tract and kidney[44] which may also affect pediatric age group45. Oral manifestations include the gingiva exhibiting erythema and enlargement,typically described as “strawberry gums”.[43,46] Treatment include administration of immunosuppressives like prednisolone and cyclophosphamide [43, 44] for which child patient must be referred without delay for medical evaluation and management[43].

Kindler syndrome is an autosomal recessive disorder[47] that may present with oral lesions that are clinically consistent with desquamative gingivitis, along with Cutaneous neonatal bullae, poikiloderma, photosensitivity, and acral atrophy.[48] Traditional non-surgical periodontal treatment can be beneficial for treating gingival menifestations.[47]

Pericoronitisis inflammation of gingival covering partially erupted tooth (most commonly third molars).[12] Food entrapment creates an ideal environment for bacterial growth leading the pericoronal flap to become inflamed and swollen.[12] The enlarged flap, traumatized by occlusion, is very painful. Debridement, chlorhexidine irrigation and antibiotics are used for management.[12]

Gingival abscessis an acute, localized, painful lesion of marginal gingiva or interdental papilla, caused by anembedded foreign objects.[12] Treatment is done by debridement, drainage and chlorhexidine irrigation.[12]

IV. Conclusion

To summarize, the differences in the causation and pathogenesis of gingival diseases in children are as varied as their adult counterpart with similar clinical presentations of gingival bleeding, pain and swelling. Nevertheless the importance of recognizing these gingival manifestations in childhood can give a clue towards an underlying pathology like nutritional deficiency, immunological disease or even a leukemic state. Therefore the thorough knowledge of gingival diseases in childhood and their treatment contributes not only towards better oral care but also augments a comprehensive general pediatric care of the individual.

References Références Referencias

1. Armitage GC: Development of a classification system for periodontal diseases and conditions, Ann Periodontol 4:1, 1999.
2. Maynard JG Jr, Ochsenbein C: Mucogingival problems, prevalence and therapy in children, J Periodontol 46:543-543, 1975.
3. Richard R. Welbury, Monty S Duggal and M.T. Hosey. Paediatric dentistry 3rded (2005); oxford: periodontal diseases in children: pg 231.
4. Andlin-Sobocki A: Changes of facial gingival dimensions in children. A 2-year longitudinal study, J ClinPeriodontol 20:212-218, 1993.
5. Bimstein E, Peretz B, Holan G: Prevalence of gingival stippling in children, J ClinPediatr Dent 27:163-165, 2003.
6. NewMan ,Takei, Klokkevold, Carranza. Carranza's clinical periodontology volume 1, 11tthed; gingival diseases in childhood: pg 143.
7. Bimstein E, Matsoon L: Growth and development considerations in the diagnosis of gingivitis and periodontitis in children, Pediatr Dent 21:186-191, 1999.
8. Srivastava B, Chandra S, Jaiswal JN, et al: Cross-sectional study to evaluate variations in attached gingiva and gingival sulcus in the three periods of dentition, J ClinPediatr Dent 15:17-24, 1990.
9. Oh Tj, Eber R, Wang HL: Periodontal Diseases in child and adolescent, J ClinPeriodontol 29:400-410, 2002.
10. Wotman S, Mercadante J, Mandel ID, et al: The occurrence of calculus in normal children, children with cystic fibrosis and children with asthma, J Periodontol 44:278-280, 1973.
11. Clerehugh V, Tugnait A: Diagnosis and management of periodontal diseases in children and adolescents, Periodontol 2000 26:146-168, 2001.
12. American academy of Pediatric Dentistry; The handbook of pediatric dentistry 3rded; periodontal diseases and conditions: pg 68.
13. Ralph E.McDonald, David R. Avery Jeffery A.Dean. Dentistry for child and adolescent; 8thedMosby: Gingivitis and periodontal diseases: pg 413.
14. Van Gastel J, Quirynin M, Teughels W, Carels C. The relationships between malocclusion, fixed orthodontic appliances and periodontal disease. A review of the literature. AustOrthod J 2007, 23:121-129.
15. Borutta A, et al. Effectiveness of powered toothbrush compared with a manual toothbrush for orthodontic patients with fixed appliances, J Clin Dent 2002;13(4):131-7.
16. Demir T, Orbak R, Tezel A, Canakc V, Kaya H: The changes in the T-lymphocyte subsets in a population of Turkish children with puberty gingivitis, Int J Paediatr Dent 19:206-212, 2009.
17. Sutcliffe P: A longitudinal study of gingivitis and puberty. Journal of Periodontal Research 1972 7:5258.
18. Modeer T, Wondimu B: Periodontal diseases in children and adolescents, Dent Clin North Am 44:633-658, 2000.
19. Cohen MM. The effect of large doses of ascorbic acid on gingival tissue at puberty, J Dent Res 34:750-751(abstract), 1955.
20. Pinson M, Hoffman WH, Garnick JJ, Litaker MS: Periodontal disease and type I diabetes mellitus in children and adolescents, J ClinPeriodontol 22:118-123,1995.
21. Lalla E, Cheng B, Lal S et al: Periodontal changes in children and adolescents with diabetes: a case control study, Diabetes Care 29:295-299, 2006.
22. Meyle J, Gonzáles R: Influences of systemic diseases on periodontitis in children and aldolescents. Periodontology 2000 26:92-112, 2001.

23. Abdullah BH, Yahya HI, Kummoona RK, et a;: Gingival fine needle aspiration cytology in acute leukemia, J Oral Pathol Med 31:55-58,2002.
24. Wahlin Y-B: Changes in oral microbiota, mucosal lesions and salivary secretion in patients with acute leukemia. Thesis Umeå, 1990.
25. Dahllöf G: Phenytoin-induced gingival overgrowth in epileptic children. A clinical, histological and biochemical study. Thesis. Stockholm, 1986
26. Hallmon WW, Rossmann JA: Role of drugs in the pathogenesis of gingival overgrowth, Periodontol 2000 21:176, 1999.
27. Daley TD, Wysocki GP, Day C: Clinical and pharmacologic correlations in cyclosporine-induced gingival hyperplasia, Oral Surg 62:417,1986.
28. Sapp JP, Eversole LR Wysocki GP: Contemporary oral and maxillofacial pathology, ed 2, St. Louis, 2004, Mosby(Elsevier).
29. NewMan ,Takei, Klokkevold, Carranza. Carranza's clinical periodontology volume 1, 11tthed; Acute Gingival infections : pg 138.
30. Blyth CC, Chen SC, Slavin MA, et al: Not just littler adult: candidemia epidemiology, molecular characterization and antifungal susceptibility in neonatal and pediatric patients, Pediatrics 123:1360-1368, 2009.
31. Edgar David Coolidge, Maynard Kiplinger Hine. Periodontology, clinical pathology and treatment of the periodontal tissues; catarrhal gingivitis: pg 188., Lea 1958.
32. Sabiston JR: A review and proposal for the etiology of acute necrotizing gingivitis, J ClinPeriodontol, 13:727-734,1986.
33. Koch G, Poulsen S: Periodontal conditions, pg 180, Pediatric Dentistry A clinical approach ed 2, 2009 Wiley-Blackwell.
34. Bernadette L. Koch, Charles Myer III, and John C. Egelhoff. Congenital Epulis; AJNR April 1997: 18
35. Haydar SG, Tercan A, Uckan S, Gurakan B.J. Congenital gum synechiae as an isolated anomaly: a case report. ClinPediatr Dent. 2003; 28(1):81-3.
36. Mohammad Ghasem Shams, Mohammad Hosein-KalantarMotamedi and Hassan LalDolat Abad. Congenital fusion of the maxilla and mandible: brief case report. Oral Surg Oral Med Oral Pathol Oral RadiolEndod 2006;102:e1-e3.
37. NewMan ,Takei, Klokkevold, Carranza. Carranza's clinical periodontology volume 1, 11tthed; classification of diseases and conditions affecting the periodontium: pg 62.
38. Dilsiz A, Aydin T: Self- inflicted gingival injuries due to habitual fingernail scratching: a case report with a 1-year follow up. Eur J dent. 3(2):150-154, Apr 2009.
39. NewMan ,Takei, Klokkevold, Carranza. Carranza's clinical periodontology volume 1, 11tthed; Gingival enlargements: pg 123.
40. Anderson J, Cunliffe WJ, Roberts DF, Close H: Hereditary dingivalfiberomatosis, Br Med J 3(5664):218-219, Jul 26,1969.
41. Sho L. yamamoto. periodontal disease: symptoms, treatment and prevention; nova biomedical books New York (2011): periodontal diseases in children and adolescent: clinical features and molecular biological analysis: pg31.
42. Ramer M, Marrone J, Stahl B, Burakoff R: Hereditary gingival fibromatosis: identification, treatment, control. JADA 127:493-495, Apr 1996.
43. Chee HK: Wegener's Granulomatosis: Strawberry Gums of the Oral Cavity Proceedings of Singapore Healthcare Volume 21 Number 1 □ 2012
44. Langford CA: Wegener's Granulomatosis Current and upcoming therapies, Arthritis Res Ther 5:180-191, 2003.
45. Orlowski JP, Clough JD, Dyment PG: Wegener's Granulomatosis in the pediatric age group. Pediatrics, 61(1):83-90, Jan 1978.
46. Cohen RE, Cardoza TT, Drinnan AJ, et al :Gingival manifestation of wegener's Granulomatosis, J Periodontol 61:705, 1999.
47. Wiebe CB, Petricca G, and Larjava HS: Kindler Syndrome and Periodontal Disease: Review of the Literature and a 12-Year Follow-Up Case.J Periodontol. May 2008; 79(5): 961–966.
48. Ricketts DN, Morgan CL, McGregor JM, et al: Kindler syndrome: a rare cause of desquamative lesions of the gingiva, Oral Surg Oral Med Oral Pathol Oral RadiolEndod 84:488, 1997.

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An Insight to Herpes Zoster Review Article

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Abstract- Herpes zoster (or simply zoster) is an acute, self- limiting viral infection characterized by painful vesicular eruptions with erythema typically present as unilateral dermatomal rash. It is caused by reactivation of dormant varicella zoster virus. About 1 million patients per year are affected by this condition. It mainly affects the elderly and persons with waning cell mediated immunity. If left untreated it may lead to various complications of significant morbidity leaving a considerable effect on quality of life as well as economic status of the patient; the most serious complication being the post herpetic neuralgia, a chronic neuropathic pain syndrome which leaves the patient in a debilitating state. This review article provides an overview of the disease and emphasizes more on the classical features and conventional treatment modalities of zoster thus enabling the oral physician to make early diagnosis and give prompt treatment, which is the mainstay for the management of the disease.

Keywords: herpes zoster, shingles, zona, varicella zoster virus, zoster sine herpete, post herpetic neuralgia, dermatomal rash, vaccine.

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Abstract- **Herpes zoster (or simply zoster) is an acute, self-limiting viral infection characterized by painful vesicular eruptions with erythema typically present as unilateral dermatomal rash. It is caused by reactivation of dormant varicella zoster virus. About 1 million patients per year are affected by this condition. It mainly affects the elderly and persons with waning cell mediated immunity. If left untreated it may lead to various complications of significant morbidity leaving a considerable effect on quality of life as well as economic status of the patient; the most serious complication being the post herpetic neuralgia, a chronic neuropathic pain syndrome which leaves the patient in a debilitating state. This review article provides an overview of the disease and emphasizes more on the classical features and conventional treatment modalities of zoster thus enabling the oral physician to make early diagnosis and give prompt treatment, which is the mainstay for the management of the disease.**

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I. Introduction

Herpes zoster also called zona or shingles is a common viral disease among the elderly and immunocompromised, is unilateral and associated with painful vesicular dermatomal skin rash and vesicles, frequently in a striped pattern.[1]

Reactivation of varicella zoster virus (vzv) causes herpes zoster (hz).[2] HZ is derived from greek word herpein meaning to creep or spread; zoster meaning girdle or zone, hence the name zona (warrior armour binding in a belt-like fashion).[2,3] Shingles, derived from latin cingulum meaning girdle (unilateral rash that enfolds like a girdle around the torso).[3]

II. Etiopathogenesis

HZ, with a lifetime risk of 10-30%, affecting about 1 million patients per year is caused by VZV.[1,4] VZV belongs to alpha herpes virinae and consists of an icosahederal nucleocapsid enclosed in lipid envelope with double stranded DNA at its centre.[2,3] The molecular weight and diameter is approximately 80 million and 150-200nm respectively.[2]

HZ, a highly transmissible disease may spread either by respiratory droplets or direct contact.[6] VZV first enters the host and causes infection of respiratory tract or epithelium of the conjunctiva.[6] It then replicates and multiplies; and then penetrates the reticulo-endothelial system from where the blood and lymphatics carry it throughout the body.[2,6] It then travels via mononuclear cells and spreads to epidermis via capillary epithelium where VZV destroys basal cells.[6] This leads to generalized rash of chickenpox. After the fall of the initial outbreak, VZV retreats into perineural satellite cells of dorsal nerve root ganglion where it remains inactive for years.[2,6] Reactivation of VZV by any triggering factor causes an outbreak and the secondary infection of HZ.[2] Therefore, the primary infection by VZV causes chickenpox(varicella) in children whereas shingles is caused by recurrent secondary infection in adults.[5] Incubation period for varicella ranges from 14-16 days; chances of transmission being high between 10-21 days after initial exposure.[2] Transmission cannot occur after crust have dried. Indirect transmission does not occur.[2] Most commonly affected dermatomes are thoracic (45%), cervical (23%) & trigeminal (15%).[7] HZ may affect sensory ganglia & its cutaneous nerves (Strommen et al. 1988)[6]. Thoracic and lumbar dermatomes are involved more commonly as compared to craniofacial area.[8] The virus may remain latent for decades together in the cranial nerve, dorsal root and autonomous nervous system ganglia along the entire neural axis.[9] 2 main mechanisms have been developed by VZV to escape the human immune system:[3]

a. Initially, VZV remains inactive in sensory ganglion, thereby restricts the expression of viral proteins. At this stage virus does not replicate but retains its capability to revert to pathogenic nature at anytime.[3]
b. Down regulating the expression of antigens of MHC Class 1 on the surface of infected cells, leads to decrease in surface expression of its proteins, thereby restricts the presentation of vital peptides to cytotoxic T-cells which ultimately leads to escape of lysis by virus infected cells.[3]

Most critical complication is a form of neuropathy of pain called post herpetic neuralgia (PHN).[9]

The pathophysiology involved is injury affecting the neurons of both central and peripheral nervous system generates spontaneous discharges.[4] It also decreases the action potential threshold which in turn decreases the generation of disproportionate pain, even with non-specific stimuli.[4]

III. Epidemiology & Predisposing Factors

HZ, a common disease with a lifetime risk of 10-30% which increases to 50% among individuals ≥85years.[1] In Australia by the age of 30 years more than 97% of population have antibodies to VZV, which

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confirms that they have been already infected with virus. Thus, the entire adult population is at a high risk of HZ.[5] 1.2-4.8 per 1000 people per year is the total incidence among immunocompetent persons.[1] HZ ranges from 14.5-53.6 per 1000 persons-years in immuno-suppressed patients.[1] HZ increases with age with approximately 14.2 per 1000 people per year in persons ≥50 years in USA,UK,Italy and Germany.[1] Recurrence is seen in approximately 4 % of patients who develop HZ.[10] HIV patients are 10 times more prone to develop HZ compared to general population.[1]HZ in organ transplant patients ranges from approximately 22-per 1000 person-years overall, with increased predilection among African-American patients (37.6 per 1000 persons-years) and heart transplant patients(40 per 1000 person-years).[1] HZ incidence is increased in patients treated with mononuclear antibody-TNF inhibitors and various biologics (19.1 per 1000-person-years) compared to non-systemic therapy patients (4.6 per 1000 person-years).[1] HZ is more liable in individuals who suffer with leukemia, lymphoma, metastatic malignancy, autoimmune disorders like SLE, RA, Wegener's Granulomatosis, Diabetes, COPD, Patients on cytotoxic drugs or steroids & those receiving chemotherapy.[1] Psychological stress may also contribute to HZ.[3] Female predilection for HZ (Thomas and Hall's systematic review).[1] Malnourishment leads to decrease in cell-mediated immunity thus increases susceptibility to HZ. Alcohol and smoking affect on HZ is still unclear.[1] Climatic changes also influences shingles wherein persons residing in temperate climate and northern latitude are at an increased rate of developing shingles.[3] Another risk factor to HZ is mechanical trauma and immunotoxin exposure.[1] Prior infection with VZV (chickenpox, vaccine) is an important predisposing factor for the development of HZ.[5] Association between varicella & HZ was first made in 1892.[11]

IV. Clinical Features

HZ presents as an acute, sporadic, self-limiting, painful unilateral vesicular dermatomal rash, often lasts for approximately 10-15 days.[5] Pain and rash are the cardinal features of HZ.[12] The prodromal (pre-eruptive) stage is characterized by pain which may be intermittent/continuous, boring, tingling, itching, burning, prickling or knife-like in the epithelium surface supplied by the affected sensory nerve.[3,13] This severe neuralgia is caused due to viral replication which in turn leads to active ganglionitis with resultant neuronal necrosis.[13] Prodrome may also be associated with mild fever, headache, malaise, dysesthesia.[3] The cutaneous features are preceded by prodromal stage (continue for 3-5 days) in 80% patients (Strommen et al. 1988, Carmichael 1991, Millar & Troulis 1994).[3,6] Odontalgia may be the only oral manifestation present at this stage (Barrett et al. 1993, Law & Lilly 1995). [6]

The Acute (active) phase is characterised by unilateral dermatomal rash associated with malaise, headache, mild fever and nausea. Rash appears proximally and spreads distally. [3] The rash advances in 12-24 hours from erythematous papules and oedema to vesicles and finally within 1-7 days it advances to form pustules.[6] The pustules then dry and form painful crust which within 14-21 days fall-off, therefore leading to formation of macular and erythematous lesions which usually heals to form hypo/hyper pigmented scars.[6] In severe cases, hemorrhagic necrosis may lead to loss of areas of epidermis and dermis (Strommen et al. 1988, Carmichael 1991).[6] Intraoral lesions usually appear after cutaneous rash.[3] HZ without rash, condition termed as Zoster sine herpete, is seen in rare cases wherein the affected patients suffer with pain which is sudden, severe and hyperesthesia over a specific dermatome.[13] Chronic neuropathic pain syndrome stage is also called as Post Herpetic Neuralgia (PHN).[6] Dworkin defined PHN as "a significant pain or abnormal sensation 120 days or more after the presence of initial rash."[4] It occurs in 20% of the affected patients.[4] PHN can be described as pain comprising of 3 prominent components: [6]

I. Constant, usually deep pain
II. Brief, recurrent shooting pain
III. Allodynia - sharp, radiating dysesthetic sensation caused by even slight touching (Rowbotham & Fields 1989).

V. Oral Manifestations

Oral complications are seen when HZ affects the Trigeminal Nerve (18-20% cases).[11] Unilateral multiple vesicular eruptions (1-4 mm) with erythema is seen intra orally.[11,13] Vesicles on palate, uvula, tonsils, tongue, buccal mucosa and floor of the mouth are seen depending upon the branch involved.[11] Apart from odontalgia, devitalised teeth, internal resorption, pulpal necrosis, developmental anomalies, sudden exfoliation of teeth, facial scarring, jaw osteonecrosis, severe periodontitis may also be appreciated.[11]

VI. Complications

a) Acute complications

May affect brain(Meningoencephalitis, Aspetic meningitis, Cranial & Peripheral nerve palsies); Ocular complications (Conjunctivitis, Episceleritis, Uveitis, Keratitis, Secondary Glaucoma,loss of Corneal Sensation, Optic neuropathy, Ptosis, Mydriasis); lungs(Neural Bronchitis, Pleuritis, Pneumonia); kidneys(Acute Renal necrosis); GIT(gastritis/ Enterocolitis); CVS (Pericarditis, Myocarditis); liver (hepatitis); Miscellaneous (Esophagitis, Arthritis, Septicemia, Cutaneous VZ dissemination, Bacterial Superinfection, Zoster granulosum, Zoster hemorr-hagicus).

b) Chronic Complications

PHN; dermatologic complications(Scar formation, Hypopigmentation); Ocular complications(Chorio-retinitis, Atrophy of optic nerve, Progressive Outer Retinal Necrosis); Deafness, Autonomic dysfunction, Bladder dysfunction; Granulomatous cerebral angiitis, Diaphragmatic paralysis, Gullian-Barre syndrome. Hutchinson's sign (unilateral cutaneous Zoster lesions of nose tip) is pathognomic of ocular inflammation and corneal denervation.[14] Argyll-Robertson pupil signifies involvement of ciliary ganglia.[14,15] Ramsay Hunt Syndrome (triad of HZ of external ear, auditory symptoms, ipsilateral facial paralysis) signifies involvement of geniculate ganglion.[11]

VII. Investigations and Diagnosis

Pain, Unilateral nature and Segmental distribution accounts for clinical diagnosis of HZ.[3]

Laboratory tests include Tzanck Smear, Viral culture (30-70% sensitive; 100% specific), FNAC from fresh vesicles.[3] Molecular techniques such as Dot-Blot hybridization and Polymerase Chain Reaction for detection of VZV DNA (approximately 100% sensitive).[11,13] Direct Immunofluorescence assay is a good diagnostic aid.[11]

VIII. Differential Diagnosis

Differential Diagnosis may include Trigeminal neuralgia, Maxillary sinusitis, Periodic Migranous neuralgia, Myocardial pain, Atypical facial pain, Munchausen's Syndrome(Drinnan 1987).[6] The Prodromal stage pain can be misdiagnosed as Pleurisy, Thrombophlebitis, Cardiac disease, Duodenal ulcer, Cholecystitis, Bell's Palsy, Otitis media, Herniated nucleus pulposus, Sensitive teeth.[11,13]

IX. Management

The primary management comprises of early diagnosis and prompt treatment in the prodromal stage. Management is emphasized towards pain control along with prevention of PHN, supportive care and hydration and definite treatment to decrease the dissemination risk especially in immunosuppressed patients.[8] Patient may be isolated to avoid cross-infection and complete bed rest may be advised. Hospitalization is advised for immunocompromised patients.

X. Treatment for Herpes Zoster

Antiviral drugs have been proven to decrease the pain and duration of rash, as well as speed up healing and prevent further complications.[3] Care should be taken to administer antivirals within 72 hours after onset of rash.[11]

a) Acyclovir : 800 mg orally five times daily for 7–10 days, or
   10 mg/kg IV every 8 hours for 7-10 days
b) Famciclovir : 500 mg orally 3 times daily for 7 days
c) Valacyclovir: 1000mg orally 3 times daily for 7 days
d) Brivudin: 125 mg/day orally for 7 days.

Recent advanced medications: [11]

a) ASP 2151 Helicase primase inhibitor
b) CMX 001 Hexadecyloxypropyl-cidofovir
c) FV 100 two bicyclic nucleoside analogue (BCNA)
d) Valamaciclovir Nucleoside analogue (H2G)

Prednisolone (60 mg daily initially, care should be taken to taper the dose for 21 days) may be useful in reducing acute pain.[12] Some cases have been treated with Amitryptiline 25 mg/day for 3 months to prevent PHN.[12] Relief from severe acute pain by administering single epidural injection of corticosteroids (80 mg methylprednisolone) and Local anesthetic (10 mg bupivacaine) may be effective.[16] Opioids and NSAID's has been proven to be effective to relieve acute pain. Oxycodone decreases acute pain and tramadol prevents PHN.[12]

XI. Treatment for Post Herpetic Neuralgia

The main objective of PHN treatment is to relieve pain and require a diverse approach. Multiple medications may be needed.[3]

The first line of treatment for PHN comprises of anticonvulsants like Phenytoin / Carbamazepine / Gabapentin (100-300 mg/day orally at bedtime). Dosage may be increased until therapy is effective and response appreciated but one should be cautious and should keep a constant check on the blood drug level.[11] Topical application of 80% capsaicin cream (3-5 times daily) and 5 % lidocaine patch (every 4-12 hours) and Aspirin cream. [8,11,12]

The second line of treatment is with opioid analgesics and tricyclic antidepressants like Amitryptiline / Desipramine / Imapramine / Nortryptiline (25 mg/day orally at bedtime). Dosage can be increased until sufficient response is met but maximum dosage should not exceed 150 mg/day. [8,11]

Systemic Corticosteroids to prevent PHN is controversial. Combination of intralesional steroids and Local anesthetic's have been proposed to hasten healing and prevent PHN.[11]

Selective Serotonin Norepinephrine Reuptake Inhibitors (SSRI's) may be administered in patients who cannot tolerate TCA's.[3]

Newer advances:[3,4]

- Electrical Stimulation of Thalamus
- Anterolateral Cordotomy
- Intercostal Nerve Cryotherapy
- Pulsed Radiofrequency Ablation
- Spinal cord stimulation
- Botulinum toxin injection

Various natural therapeutics may include Multiple nutrients (vitamin A, B6, C & E, Folic acid, zinc, iron);[17] Enzyme preparations (trypsin, chymotrypsin, papain);[18] Capsaicin; Licorice; Madonna lily; Reishi mushroom; Honey; Aloe.[2]

XII. Prevention

In 1995, Varicella vaccine was recommended in USA for healthy children >1 year old, susceptible adolescents and also adults.[1] In 2006, the FDA recommended a live attenuated vaccine derived from the oka strain of VZV for prevention of HZ and its complcations.[12] Since then a decrease of 90-95% of VZV infection in children aged 1-9 years was observed.[4] It is safe, well- tolerated cost-effective and efficient. Protection by the vaccine remains for about 7 years.[19]

A single 0.65 ml dose injected subcutaneously in the deltoid region.[20] Vaccine cause an upgrade in cell-mediated immunity thereby causing a decrease in shingles and also decreased incidence of PHN.[4] It also decreases the burden of illness.[5] Studies have shown a decrease of 51.3% in incidence of HZ; 66.5% in incidence of PHN; 61% in BOI score.[5] FDA recommends HZ vaccine for adults ≥ 50 years irrespective of person suffering with prior HZ episode.[3] ACIP (Advisory Committee on Immunization Practices) has not applied any upper age limit for vaccine.[3] Care should be taken to increase the vaccination coverage if zoster vaccine is given simultaneously with other vaccine.[1] Several studies are being conducted on effects of inactivated VZV vaccine for immunosuppressed patients for who live attenuated vaccine is not recommended.[3] Vaccine should be kept frozen at -15˚C(once opened should be used within half an hour).[3] FDA has approved transportation and storage at 2-8˚C and upto 72 hours.[20] Contraindications may include cases of life threatening hypersensitivity reactions, HIV patients with CD_4 count <200, Patients on chemo/radiotherapy, Pregnancy and Breast feeding.[3]

XIII. Conclusion

HZ though being a self-limiting condition, if left untreated can lead to various complications involving almost all the organs of human system, with PHN being the most critical one. However, an oral physician can be the first one to recognize the signs and symptoms thereby, being the first ones to make the initial diagnosis. Thus, dentists should have complete knowledge about the disease so that prompt treatment can be given and patient management can be done early and efficiently.

References Références Referencias

1. Harriet J. Forbes, Sara L. Thomas, Sinead M. Langan. The Epidemiology and Prevention of Herpes Zoster. Curr Derm Rep 2012; 1:39-37.
2. Mario Roxas, ND. Herpes Zoster and Post Herpetic Neuralgia: Diagnosis and Therapeutic Considerations. Alternative Medicine Review 2006; Volume 11 (2): 102-113.
3. Singh BS., Scholand SJ. Herpes Zoster: a Clinical Review. J Infect Dis Antimicrob Agents 2011; volume 28 (3): 211-221.
4. Christopher Gharibo, Carolyn Kim. Neuropathic Pain of Postherpetic Neuralgia. Pain Medicine News Special Edition 2011; 84-92.
5. Herpes Zoster: Zoster Vaccine for Australian Adults. NCIRS Fact sheet: November 2009; 1-7.
6. E. Tidwell, B. Hutson, N. Burkhart, J. L. Gutmann, C. D. Ellis. Herpes Zoster of the trigeminal nerve third branch: a case report and review of the literature. International endodontic Journal 1999; 32: 61-69.
7. Manjunath Reddy Bandral, Chidambar Y.S., Swaroop Telkar, Sharnbasappa Japatti, Lalit Choudary, Arun Dodamani. Oral Complications of Herpes Zoster Infection- Report of 3 cases. International Journal of Dental Clinics 2010; 2 (4): 70-73.
8. Greenberg, Glick, Ship. Burket's Oral Medicine: Diagnosis and Treatment. 11th edition. BC Decker Inc: Elsevier; 2003. p. 55-57.
9. Mohit Bansal, Shipra Gupta, Neeraj Sharma. Herpes zoster infection: A case report. Indian Journal of Dentistry 2012; 3(3): 174-177.
10. Jessie McCary. The Health Care of Homeless Persons - Part 1 -Herpes Zoster (Shingles) : 47-51.
11. D.A.Vineet, R.Mithra, Pavitra Baskaran, Satyaranjan Mishra. Oro-facial Herpes Zoster: A Case Report With A Detailed Review Of Literature. Oral & Maxillofacial Pathology Journal 2013; 4(1): 346-354.
12. David W. Wareham, Judith Breuer. Herpes zoster: clinical review. BMJ 2007; Volume 334: 1211-1215.
13. Neville , Damm, Allen, Bouquot. Oral & Maxillofacial Pathology. 2nd edition. Saunders: Elsevier; 2002. p. 222-224.
14. Womack LW, Liesegang TJ. Complications of herpes zoster ophthalmicus. Arch Ophthalmol. 1983; 101: 42-45.
15. Atherton DJ, Gennery AR, Cant AJ. Varicella-zoster virus. In: Burns T, Breathnach S, Cox N, Griffiths C, editors. Rook's textbook of dermatology. 8th edition, vol. 33. Blackwell: oxford; 2010. p. 22-28.
16. Wim Opstelten, Just Eekhof, Arie Knuistingh Neven, Theo Verheij. Treatment of herpes zoster: clinical review. Canadian family physician 2008; 54: 373-7.
17. Thomas SL, Wheeler JG, Hall AJ. Micronutrient intake and the risk of herpes zoster: a case-control study. Int J Epidemiol 2006; 35: 307-314.
18. Desser L, Holomanova D, Zavadova E, et al. Oral therapy with proteolytic enzymes decreases excessive TGF-beta levels in human blood. Cancer Chemother Pharmacol 2001; 47: S10-S15.
19. Marla Shapiro, Brent Kvern, Peter Watson, Lyn Guenther, Janet McElhaney, Allison McGeer.

Clinical review: Update on herpes zoster vaccination. Canadian family physician 2011; 57: 1127-31.
20. Willison CB, Morrison LK, Mendoza N, Tyring SK. Shingles vaccine. Expert Opin Boil Ther 2010; 10: 631-8.

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Calcifying Cystic Odontogenic Tumor – A Case Report and Review on Diverse Presentation of the Tumor

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Abstract- The calcifying odontogenic cyst (COC) accounts for about 1% of all the jaw cysts, found most commonly within the bone. The lesion shows extreme diversity in its clinical, radiological and histopathological features as well as in its biological behavior. In addition, the calcifying odontogenic cyst may be associated with other odontogenic tumors, most commonly odontoma. Calcifying odontogenic cyst associated with Ameloblastoma and Adenomatoid Odontogenic Tumor has also been reported[1]. Here we present a case of a 29 year old male patient with a large COC associated with an impacted 38 and involving the left body and angle of mandible with diverse clinical and radiological appearance.

Keywords: calcifying odontogenic cyst; diverse clinical, radiological and histological presentation; odontogenic tumors; calcifying cystic odontogenic tumor.

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Calcifying Cystic Odontogenic Tumor – A Case Report and Review on Diverse Presentation of the Tumor

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Abstract- The calcifying odontogenic cyst (COC) accounts for about 1% of all the jaw cysts, found most commonly within the bone. The lesion shows extreme diversity in its clinical, radiological and histopathological features as well as in its biological behavior. In addition, the calcifying odontogenic cyst may be associated with other odontogenic tumors, most commonly odontoma. Calcifying odontogenic cyst associated with Ameloblastoma and Adenomatoid Odontogenic Tumor has also been reported[1]. Here we present a case of a 29 year old male patient with a large COC associated with an impacted 38 and involving the left body and angle of mandible with diverse clinical and radiological appearance.

Keywords: calcifying odontogenic cyst; diverse clinical, radiological and histological presentation; odontogenic tumors; calcifying cystic odontogenic tumor.

I. Introduction

Calcifying odontogenic cyst (COC) was first described as a distinct clinicopathologic entity by Gorlin et al., in 1962. Ever since then controversy and confusion have existed regarding its nature[2]. According to the WHO classification in 2005, COC has now been reclassified as calcifying cystic odontogenic tumor (CCOT). The lesion shows extreme diversity in its clinical and histopathological features as well as in its biological behavior. CCOTs are frequently associated with odontogenic tumors, a finding which is a rare event in other types of odontogenic cysts or tumors[3, 4, 5, 6, 7, 8].

Central and peripheral forms of calcifying odontogenic cyst occur equally in the upper and lower jaws. Johnson et al reported the occurrence of 60% of the tumors in mandible, 30% in the form of peripheral calcifying odontogenic cysts and anterior part of the jaw was involved in 53% of cases9. On the basis of 52 examples of calcifying odontogenic cysts associated with an odontoma Hirschberg et al concluded that the upper jaw was affected in 61.5% and the anterior region of the jaw in 75% of the reported cases[10].

Calcifying cystic odontogenic tumor can occur in very young patients, even in the first year of life.

Cases have also been recorded of patients in their eighties[11]. However, in the majority of cases it occurs in the second decade of life[12, 13].

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CCOT may clinically be diagnosed as Ameloblastoma, Calcifying epithelial odontogenic tumor, Adenomatoid odontogenic tumor, Ameloblastic fibroodontoma, complex or compound odontoma and dentigerous cyst or as other types of odontogenic cysts.

A hybrid odontogenic tumour composed of a calcifying cystic odontogenic tumour (CCOT), a solid multicystic ameloblastoma (A-S/M) and an Adenomatoid odontogenic tumour (AOT) was reported in the anterior part of the mandible of a 64-year-old Chinese woman[5]. This further confirms the diverse histopathologic presentation of the tumor.

II. Case Report

A 29-year-old male patient visited the department of oral medicine and radiology of Farooqia Dental College and Hospital, with a chief complaint of swelling in the left side of face since 7 months. Swelling which started gradually increased to attain the present size. No history of pus, blood or watery discharge, color change or parasthesia noted over the swelling. No history of difficulty in opening the mouth, speaking and swallowing food. History of difficulty in chewing the food from affected side. No history of pain and any other associated symptoms like fever, loss of appetite, loss of weight, diarrhea or fatigue. Patient gave history of noticing mobility of teeth in the region of complaint since 4 months.

On local extraoral examination, a solitary ill defined oval swelling measuring about 4 X 5 centimeters is present over the left body and angle of mandible. Superiorly the swelling extends from 1 cm below the zygomatic arch to 1 cm beyond the lower border of the mandible. Anteriorly, the swelling extends from 1cm distal to the angle of mouth to the ramus of mandible posteriorly. The skin over the swelling is stretched with obliteration of the Nasolabial fold. There is no evidence of pus, blood or watery discharge and no secondary changes were noted. The surrounding area appears normal.

On palpation the swelling was tender, firm - hard in consistency, with smooth surface and well defined borders. The swelling was non fluctuant, non compressible, non depressible, immobile and no discharge was elicited.

Intraoral hard tissue examination revealed Grade I mobility i.r.t [35] and Grade III mobility i.r.t [36, 37]. On Soft tissue examination vestibular obliteration and tenderness present i.r.t [34, 35, 36, 37]. Color of the mucosa appeared normal with no sinus opening noted over the vestibule. No evidence of ulcer or growth noted in the soft tissue. Buccal and lingual cortical plate expansion with perforation of the buccal cortical plate was present.

The orthopantomograph revealed a multilocular radiolucency on the left side of the mandible extending from the periapical region of first premolar up to the angle of mandible. The lesion contained the unerupted third molar displaced distally near the angle of mandible. Resorption of the apical 1/3rd of the root of 35 and apical and middle 1/3rd of the mesial and distal roots of 36 and 37 was evident. There was break in the continuity of lower border of mandible without any pathological fracture.

Based on history, clinical features and radiographic appearance, a differential diagnosis of Ameloblastoma, Keratocystic Odontogenic Tumor, Calcifying Cystic Odontogenic Tumor and Odontogenic myxoma was considered.

An incisional biopsy was obtained from the lesion to establish the final diagnosis. Histopathologic examination revealed epithelial lining consisting of tall columnar basal and superficial stellate reticulum like cells along with areas of eosinophilic ghost cells suggestive of Calcifying cystic odontogenic tumor.

III. Discussion

CCOT was first described in 1932 by Rywkind who reported a lesion of the jaw which resembled cholesteatoma of the ear and thereafter called it as cholesteatoma of the jaw. In 1946, Thoma and Goldman described a lesion which they called a strange variant of ameloblastoma. It was in 1962 that Gorlin first described it[2, 3, 14].

CCOT represents 2% of all the odontogenic pathological changes of the jaws, although it can be found in isolation, it is usually associated with other odontogenic tumours, most frequently with odontoma in 24% of the cases[15].

According to few studies CCOT is more common in females and in maxilla where as there are reports of CCOT occurring more in males and in mandible[16].Cases have also been reported where Calcifying cystic odontogenic tumor is provisionally diagnosed as a residual cyst[15] as well as a periapical pathology[17].

Radiographically, they are clearly delineated and appear as unilocular or multilocular radiolucencies. Scattered irregular sized calcifications producing a mixed radiopaque radiolucent lesion may also be encountered, which may coalesce later and give an appearance of tooth like densities within the lesion[2, 13]. COC can occur alone or in association with other odontogenic tumors such as odontomas (20%), adenomatoid odontogenic tumors and ameloblastomas.

However, this association is a challenge for diagnosis using only conventional images, due to the presence of numerous over lapped images of anatomical structures of the maxillofacial region. Root resorption and divergence of roots of the associated teeth are common radiographic findings, and an association with an impacted tooth occurs in approximately one-third of cases[18]. This further suggests the diverse radiographic presentation of CCOT.

The present case occurred in a 29 year old male and is in the mandibular left posterior teeth region associated with an impacted tooth.

It demonstrated a gradual increase in size of the swelling with associated mobility of teeth and was found to be much larger measuring 3x7 cm which is in contrary to what has been reported.

Expansion of the labial or buccal cortical plate invariably occurs usually sparing the lingual cortical plate.

The reported case here is unusual to what has been published in literature since lingual cortical expansion was noted along with perforation of the buccal cortical plate and resorption of lower border of mandible without any evidence of pathological fracture.

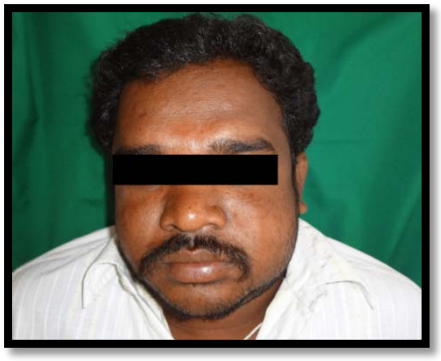
In conclusion, the diverse clinical and radiological presentation of calcifying odontogenic cyst makes it difficult to diagnose clinically. Calcifying cystic odontogenic tumor (CCOT) is an uncommon odontogenic tumor.

Although rare, because of its variable presentation calcifying cystic odontogenic tumor should be included in the differential diagnosis of jaw lesions.

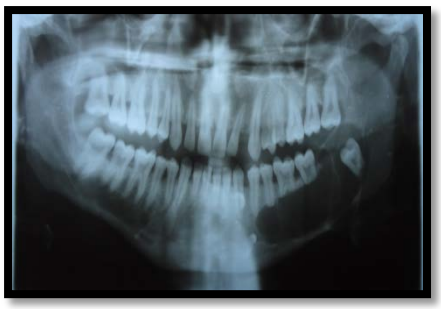
References Références Referencias

1. Neville BW, Damm DD, Allen CM, Bouquot JE. Oral and maxillofacial pathology. 3rd ed. St. Louis: Saunders; 2009: 695–7.
2. Reichart PA, Philipsen HP. Odontogenic tumors and allied lesions. London: Quintessence; 2004:141-53.
3. Menat S, Shylaja MD, Attur K, Goyal K. Ameloblastomatous CCOT: A Case Report of a Rare Variant of CCOT with a Review of the Literature on Its Diverse Histopathologic Presentation. Case Reports in Dentistry. 2013.
4. Chaubey SS, Mishra SS, Degwekar SS, Chaubey S. A rare presentation of hybrid odontogenic tumor involving calcifying cystic odontogenic tumor and plexiform Ameloblastoma. Contemp Clin Dent. 2013 Jul-Sep; 4(3):406–408.
5. Zhang W et al. A case report of a hybrid odontogenic tumour: Ameloblastoma and adenomatoid odontogenic tumour in calcifying

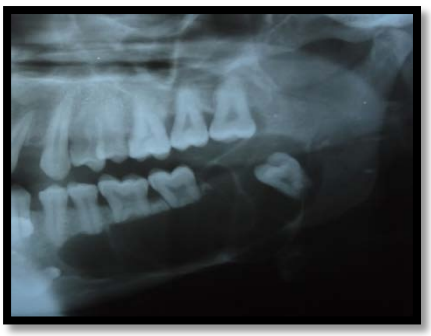
cystic odontogenic tumour. Oral Oncology EXTRA (2006) 42:287-90.
6. Aswath N, Mastan K, Manikandan T, Samuel G. Odonto calcifying cyst. Contemp Clin Dent. 2013; 4(1):108-11.
7. Atun JML, Carnate JM. Calcifying Cystic Odontogenic Tumor Associated with a Complex Odontoma. Philipp J Otolaryngol Head Neck Surg 2013; 28 (2):35-36.
8. Biradar VG. Ameloblastoma arising in calcifying odontogenic cyst: A rare histologic variant. Int J Head Neck Surg 2012; 3(2):106-107.
9. Johnson A, Fletcher M, Gold L, Chen SY. Calcifying odontogenic cyst: A clinicopathologic study of 57 cases with immunohistochemical evaluation for cytokeratin. J Oral Maxillofac Surg. 1997 Jul; 55(7):679-83.
10. Hirshberg A, Kaplan I, Buchner A. Calcifying odontogenic cyst associated with odontoma: a possible separate entity (odontocalcifying odontogenic cyst). J Oral Maxillofac Surg. 1994 Jun; 52(6):555-8.
11. Thinakaran M, Sivakumar P, Ramalingam S, Jeddy N, Balaguhan S. Calcifying ghost cell odontogenic cyst: A review on terminologies and classifications. J Oral Maxillofac Pathol. 2012; 16:450-53.
12. Cury SE, Cury SN, Cury M , Calderoni A , Fajardo VD, Carvalho MR, Luderer LA. Calcifying Cystic Odontogenic Tumor : Case Report. Webmed Central ORAL MEDICINE 2011; 2(12):WMC002583.
13. Vasudev S et al. Calcifying cystic odontogenic tumor- a unique developmental lesion arising in mandible. Health Renaissance, 2012 Jan-Apr; 10 (1):64-68.
14. Gorlin RL, Pindborg JJ, Clausen F, Vickers RA. The calcifying odontogenic cyst - A possible analogue of the cutaneous calcifying epithelioma of Malherbe. Oral Surg Oral Med Oral Pathol.1962; 15:1235–43.
15. Manveen J K, subramanyam RV, Simmerpreet S V, Ramandeep NS. Calcifying Cystic Odontogenic Tumour Mimicking As a Residual Cyst. Journal of Clinical and Diagnostic Research. 2010 Aug; 4:2979-2983.
16. Habibi A, Saghravanian N, Salehinejad J, Jafarzadeh H. Thirty years clinicopathological study of 60 Calcifying cystic odontogenic tumors in Iranian population. J Contemp Dent Pract. 2011; 12(3):171-73.
17. Balaji SM, Rooban T. Calcifying odontogenic cyst with atypical features. Ann Maxillofac Surg 2012; 2:82-85.
18. Buchner A. The central (intraosseous) calcifying odontogenic cyst: an analysis of 215 cases. J Oral Maxillofac Surg. 1991 Apr; 49(4):330-9.



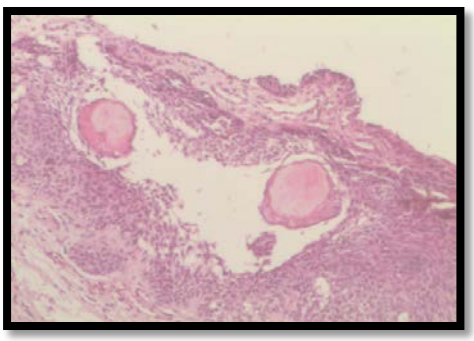
Extra Oral Photograph



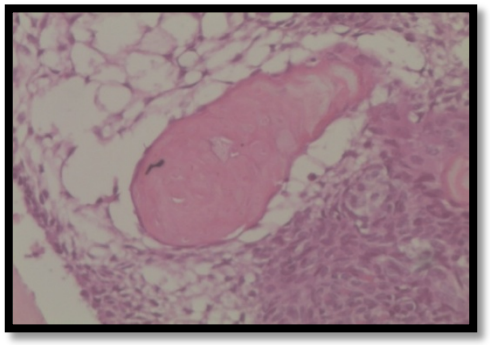
Opg Showing The Multilocular Radiolucency



Cropped Image Of The Opg



Histopathologic Section – 20x Magnification



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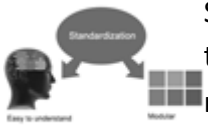

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Discussion:

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.

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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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