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Multi Detector 3D Computed Tomography in the Diagnosis of Paraganglioma: A Case Report

By Elsafi Ahmed Abdalla, Caroline Edward Ayad, Mohammed Abdallwahab & Monadil Awad
Sudan University of Science and Technology, Sudan

Abstract- This report describes a case of 45-year-old female with carotid body paraganglioma. This study was conducted in May 2014. CT scanning was performed using high-resolution techniques. The 3D Volume-Rendering reconstructions provided a selective visualization of the anatomic relationships among carotid body tumors, vessels, and surrounding osseous structures with excellent details. Both tumors were suggested to be treated surgically with histological analysis.

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Multi Detector 3D Computed Tomography in the Diagnosis of Paraganglioma: A Case Report

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[Defraigne JO et al, 1997, Devuyever D et al1993]. Radio immune detection of carotid body paraganglioma was also depicted in the previous studies [DevuyeverD, 1993].

The surgical removal is the treatment of choice for carotid body paragangliomas[Rush Bf Jr1962].

Multislice CT angiography can demonstrate a large, carotid body tumor, as well as small, unsuspected mass within the carotid bifurcation The 3D vdume-rendering reconstructions provide a selective visual-ization of the anatomic relationships among carotid body tumors, vessels, and surrounding osseous structures with excellent detail. The diagnosis of this case was derived from the above mentioned facts.

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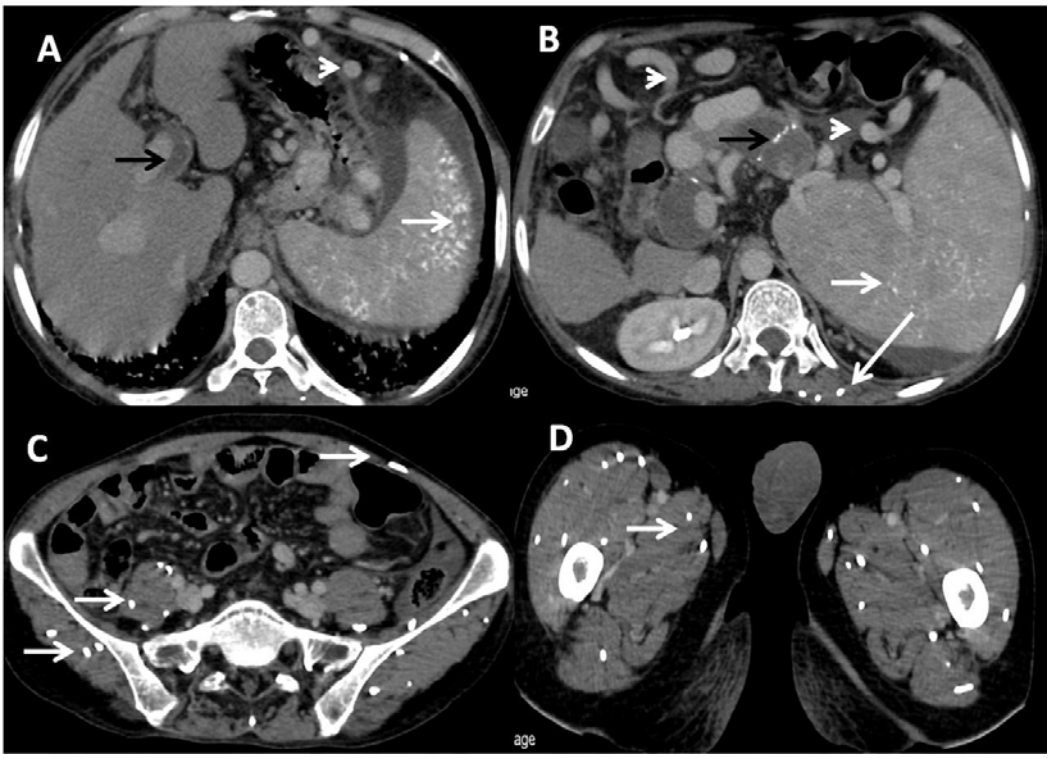

Figure 1 : Contrast enhanced computed tomography (CECT) axial images show **(Figure 1 A, B)** shrunken liver with widened ligament falciparum fissure. The spleen is massively enlarged and shows multiple small specks of calcification (white arrows). The portal vein and splenic vein are distended with thrombus in which foci of calcification are evident (black arrows). Multiple collateral vessels are also seen (white arrow head). **(Figure 1 C, D)** - Rice grain like calcifications are seen in bilateral psoas, gluteal muscles, paraspinal muscles and thigh muscles

Figure 2 : Contrast enhanced computed tomography (CECT) coronal images show **(Figure 2A)** cirrhotic liver, thrombosed portal and splenic vein with calcified cysticercal larvae within it (black arrows), splenic enlargement with multiple calcifications (white arrows). **Figure 2B** shows calcified larvae in paraspinal muscles and gluteal muscles

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Presacral Cold Abscess a Rare and Special Case of Skeletal Tuberculosis

Dr. Ashfaq Ul Hassan [α], Dr. Rohul Afza Kaloo [σ], Dr. Zahida Rasool [ρ] & Dr. Obaid [ω]

Abstract- Skeletal Tuberculosis is a not that common nowadays due to effective antitubercular chemotherapy available along with the fact that most cases of primary tuberculosis are diagnosed quite ealy. Furthermore Presacral tubercular abscesses are a rare entity . Lumbosacral region is the least effected. We report a case of a patient with presacral abscess in a patient without any source of tuberculosis elsewhere. We present a rare case of large presacral abscess simulating a big tumor and MRI Done showed a large presacral abscess . It was managed by drainage through a trans pedicular route.

Keywords: presacral, vertebrae, joint, abscess, therapy, histiocyte, granuloma .

I. Introduction

The known fact that the incidence of tuberculosis had decreased significantly due to significant development of effective ant tubercular therapy coupled with the fact that tuberculosis is diagnosed at earlier stages have contributed to the reduction of pulmonary tuberculosis. However In recent years, there has been an increase in the incidence of tuberculosis associated with HIV infections.

Tuberculosis is one disease which can effect virtually any body system. When bones are effected in case of Skeletal tuberculosis, it is invariably as a result of hematogenous seeding of tubercle bacilli from a pre-existing lung lesion or gastrointestinal focus. The tubercle bacilli frequently infect the joints and intervertebral discs initially followed by the infection of the long bones. It has been seen that the intervertebral discs of the lower thoracic and upper lumbar spine account for 25- 30% of all cases of skeletal tuberculosis. The present article describes the clinical rarity associated with tuberculosis which presented like a tumor mass in the patient. On further evaluation of the mass it was found to be tubercular in origin.

II. Text

The patient had hip pain as well as lower back for last six months with slight painful movements of the hips. There was no past history of tuberculosis or immunosupression.

- Laboratory examination revealed a elevated white cell count, an elevated erythrocyte sedimentation rate.
- The tuberculin skin test was positive.
- The white cell count was elevated, with an increased number of mononuclear cells.
- Lab Investigations of Patient

- Temp: 98.70F
- BP: 126/78
- RR: 12/Min
- Pulse 82 bpm
- HB: 13.7 gm/dl
- WBC : 11,200 / microlitre
- Platelets : 2,30,000/microlitre (n 150000-400,000)
- Sodium: 144meq/L (n 135-145)
- Potassium : 4 meq/L(n 3.5-5)
- ESR Significantly raised : 56
- CXR: Normal
- USG Abdomen: Normal
- CT scan /MRI Pelvis: Large Presacral mass

III. Discussion

Presacral tubercular abscesses are a rare entity.[1]. Buyukbebeci reported one case of presacral abscess.[2] Following hematogenous inoculation, tubercle bacilli can lodge at multiple sites in the subchondral bone of the epiphysis, in the joint capsule, or in the synovial membrane. The initial host response is an infiltration of lymphocytes, plasma cells, and histocytes. The multifocality of tuberculosis is a well established fact.[3]. However the present patient had no evidence of Pulmonary Tuberculosis as evidenced by a normal chest radiograph and sputum culture.

IV. Pathology

The histologic appearance of the tuberculous lesion in bone resembles that observed in visceral tuberculosis.[4] Histiocytes, Langhans giant cells, and fibroblastic proliferation[5] are all present. Caseous necrosis is less frequently seen in joint lesions than in pulmonary lesions.[6] Within the joint, invasion of bone tends to occur at the margins where synovium is attached to bone, producing a characteristic marginal defect.[7] The weight-bearing areas of the joint tend to be spared in the early phase of the disease, and there is

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preservation of joint width on early radiographs. As destruction proceeds, the joint becomes filled with necrotic products and fragments of articular cartilage, material called rice bodies because of its resemblance to grains of rice. In some instances, joint or disc space infection burrows into adjacent soft tissues, extends along fascial planes, and may eventually penetrate the skin, producing a draining sinus tract.

The destruction of bone and articular cartilage by tuberculous infection is a slow process, and symptoms are correspondingly insidious in their development. The patient usually complains of a dull ache in the area of the affected joint. A history of weight loss and easy fatigability may be obtained. There may be a history of close contact with a family member or friend with known tuberculosis.

Spinal involvement with tuberculosis produces diminished motion at the thoracolumbar level.[8] Protective paraspinal muscle spasm holds the back hyperextended.[9] If the tuberculous process has escaped the confines of the disc space and adjacent vertebrae[10], a large paraspinal abscess may result. As the spine becomes weakened, collapse of the vertebral column may occur, forcing caseous necrotic debris into the spinal canal and producing neurologic symptoms ranging from paresis to complete paraplegia. The paraspinal abscess developing around a focus of tuberculous infection may extend some distance beneath the paraspinal muscle and present as a mass above the posterosuperior iliac crest, or it may extend down the psoas muscle and present as a mass in the medial thigh. On incision, these masses produce caseous necrotic material but characteristically do not have any associated erythema or increased heat. This clinical presentation is known as a cold abscess. The first radiographic change in tuberculous spondylitis is narrowing of the disc at the affected level. The outlines of the adjacent vertebral end plates become indistinct in appearance. As the disease progresses, the combination of interspace narrowing and vertebral collapse may produce a kyphotic deformity. If a paraspinal abscess is present, it usually produces a soft tissue shadow on plain radiographs. Calcification is occasionally observed within the abscess. The patient had ignored the symptoms for a long period of time and ultimately presented at a late stage when the tubercular disease had progressed and a big abscess had already been formed.

Radiographs of tuberculous joints demonstrate generalized osteoporosis, with preservation of the joint width and distention of the joint capsule. The earliest bony changes consist of erosion of the joint margins at the point of synovial attachment to bone. Similar defects may occur within the epiphysis, and infection may cross the epiphyseal plate into the adjacent metaphysis. When the hip joint in children is involved, progressive capsular distention may interrupt the blood supply to the capital femoral epiphysis. This patient had already developed a large abscess in front of the sacrum. MRI/CT Scan diagnosed the same. After diagnosis, the patient was surgically managed and the abscess was managed by drainage through a trans pedicular route. Six months after the treatment paient was followed up and had absolute recovery.

V. Conclusion

Tuberculosis can effect any site in the body and its manifestations as regards skeletal tuberculosis can also be varied. Early recognition of tubercular abscesses and drainage is of utmost importance. Late presentation can lead to complications and increase in morbidity. Presacral region is a difficult region for drainage ans anterior approach is the most preferred.

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Fig. 1: CT Scan demonstrating Presacral abscess depicted by arrow

Fig. 2: MRI Scan demonstrating Presacral abscess denoted by arrow

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Comparison of the Spo_2/Fio_2 Ratio and the Pao_2/Fio_2 Ratio in Patients with Acute Lung Injury or Acute Respiratory Distress Syndrome

Nemat Bilan [α], Azar Dastranji [σ] & Afshin Ghalehgolabbehbahani [ρ]

Abstract- ***Background:*** Diagnostic criteria for acute lung injury(ALI) and ARDS requiring acute onset of disease, chest radiograph demonstrating bilateral pulmonary infiltrates, lack of significant left ventricular dysfunction and $\frac{Pao_2}{Fio_2}$ (PF) ratio ≤300 for ALI or ≤200 for ARDS. recent criteria is requiring invasive arterial sampling.

The pulse oximetric saturation Spo_2/Fio_2 (SF) ratio may be a reliable non invasive alternative to the PF ratio.

Methods : In this cross sectional study , Enrolled 70 patient ALI or ARDS that Admitted in Tabriz children's hospital PICU. Included in the analysis were corresponding measurement of Spo_2,Fio_2, Pao_2,charted within 5 min of each other And computed SF and PF to determine the relationship between SF and PF ratio. SF threshold values were determined to replacement PF ratio for diagnose ARDS and ALI.

Results: The relationship between SF and PF ratio was described by the following regression equation SF=57+0/61PF (P<0/001). SF ratios of 181 and 235 corresponded of PF ratio 300 and 200. The ALI SF cutoff of 235 had 57% sensitivity and 100% specificity, and ARDS, SF cutoff of 181 had 71% sensitivity and 82% specificity.

Conclusion: SF ratio is a reliable noninvasive marker for PF ratio to identify children with ALI or ARDS and can be replaced pulse oximetry by arterial blood sampling.

Keywords: ARDS, ALI, $\frac{pao_2}{Fio_2}$ *, pulse* oximetry.

Abbreviations: ***Pao_2:*** *Arterial partial pressure of oxygen ,* ***Spo_2:*** *pulse Oximetric oxygen saturation,* ***ARDS:*** *Acute Respiratory Distress syndrome,* ***ALI:*** *Acute lung injury,* ***Fio_2:*** *Fraction of inspiratory oxygen,* ***SF=*** $\frac{spo_2}{Fio_2}$ *ratio ,* ***PF=*** $\frac{Pao_2}{Fio_2}$ *ratio* ***,ABG=*** *Arterial blood gas analysis,* ***PICU=****Pediatric Intensive Care unit,* ***$Paco_2$:*** *Arterial partial pressure of carbon dioxid,* ***Sao_2=*** *Arterial oxygen saturation.*

I. Introduction

Acute lung injury and ARDS are terrible syndromes with high mortality and morbidity [1-2]. It is estimated that 30 to 60% of all PICU admitted patient require mechanical ventilation and of these patient up to 25% may have ALI and 5 to10% may have ARDS. With the implementation of lung-protective ventilation strategies overall morbidity and mortality have improved signify-cantly for both adult and children with ALI and ARDS[3-4]. Based on American European consensus conference (AECC) in 1994: Diagnostic criteria for acute lung injury(ALI) and ARDS requiring acute onset of disease, chest radiograph demonstrating bilateral pulmonary infiltrates, lack of significant left ventricular dysfunction and $\frac{Pao_2}{Fio_2}$ (PF) ratio ≤300 for ALI or ≤200 for ARDS[5]. The first three components can be established with clinical history or noninvasively tools such as chest radiograph or echocardiography. However PF criteria require arterial blood sampling [6-7]. Concerns about anemia following blood sampling and a movement to minimally invasive approaches have led to reduction blood gas measurements in critically ill patient[8-9]. however studies in ARDS and ALI patient are lacking .Furthermore SF threshold values could be used for diagnosing ARDS and ALI[6-10].

Pulse oximetry is the most commonly utilized technique to monitor Oxygenation.Noninvasive and safe. It indirectly measures arterial hemoglobin O_2 Saturation by differentiating oxy hemoglobin form deoxygenated hemoglobin using their respective light absorption at wave lengths of 660 nm (red) and 940 nm (infra red)[11-12]. Pulse oximetry is used:1-detection of hypoxia.2-preven tion of hyperoxia. 3-for weaning from mechanical ventilation 4-titration of Fio_2[9-13].

In most PICU daily arterial blood sampling to calculate the PF ratio often impossible,then calculate the SF ratio and replacement by PF ratio for diagnose ARDS or ALI is non invasive and affordable [14]. Using SF ratio determine the degree of hypoxemianon invasively without the need for arterial blood sampling[7].

In this study we computed the relationship between SF and PF ratio in critically ill patient with ALI and ARDS. We hypothesize that the continuously available and noninvasively SF ratio can be used instead the PF ratio in diagnosis of ALI and ARDS.

II. Methods

In this cross sectional study 70 children with ARDS or ALI that admitted in Tabriz children's hospital

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PICU, Iran between 2012 and 2013 were studied. In Patient with ARDS or ALI under Mechanical ventilation with same Fio_2, Pao_2measared with Arterial blood sampling and Spo_2 measured with pulse oximetry and charted with in 5 min of each other.Computed SF and PF ratio.

Inclusion criteria were children with ARDS or ALI and acute onset of disease and chest radiograph demonstrating bilateral pulmonary infiltrates, consistent with pulmonary edema.

Exclusion criteria were children with pulmonary edema due to heart failure and congenital heart disease and Anatomic anomalies of lung or air ways.

III. Statistical Analysis

Statistical analyses were performed using the Statistical Package for Social Sciences, version 17.0 (SPSS,Chicago,Illinois). Quantitative data were pre sented as mean ± standard deviation (SD), while qualitative data were demonstrated as frequency and percent (%). The categorical parameters were compared by (χ^2) tests, and the continuous variables were compared by independent t test. A p value of <0.05 was considered statistically significant. Relationship between SF and PF, described by linear regression equation. ROC curves were plotted to determine the sensitivity and Specificity of the SF threshold values correlating with PF of 200 (ARDS) and 300 (ALI).

IV. Results

Of 70 children enrolled in this study, included 38 patient female (54.3%) and 32 patient male (45.7%) with a mean age of 32± 5 months (mini mum 2 and maximum 144 months).

A total of 70 data pairs 56 (80%) met the PF ratio criteria for RADS and 14(20%) met the PF criteria for ALI. The median time difference between charted values of Spo_2 and Pao_2 pairs was 5 min . Table (1) demonstrates baseline findings of the patients enrolled in the study.

Age was no significantly relationship with SF ratio. Pvalue = 0.81 and was no significantly relationship with PF ratio Pvalue=0.99.

Sex was no significantly relationship with SF ratio Pvalue = 0.77 and was no significantly relationship with PF ratio Pvalue =0.06.

In general , SF ratio could be predicted well from PF ratio, described by the linear regression equation SF =57+0.61 PF. Based on this equation a PF ratio of 300 corresponds to an SF ratio of 235 and PF ratio of 200 to an SF ratio of 181. Pvalue <0.001[Fig1] The ALI SF cut off of 235 had 57% sensitivity and 100% specificity and ARDS cut off of 181 had 71% sensitivity and 82% specificity.

In general, the SF ratio had excellent discrimination ability for ARDS(AUC=0.86) [Fig2] and good discrimination ability for ALI and ARDS (AUC=0.89) [Fig3].

Table 1 : demonstrates base line findings of the patients

	MAX-MIN	MNAE
Pao_2/ Fio_2	298-46	155±61
Spo2/Fio_2	248-77	152±47
Spo_2	99-71	94±4
Fio_2	100-40	67±18
Pao_2	176-41	96±25
age	144-2	32±5

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