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RESEARCH ARTICLE

TALOCALCANEAL COALITION—A FREQUENTLY OVERLOOKED CONDITION.

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Abstract

Congenital tarsal coalition is a diagnosis that is often overlooked in young patients who first present with foot and ankle pain. Tarsal coalition is an abnormal fibrous, cartilaginous or osseous fusion of two or more tarsal bones [1].

The prevailing etiologic theory for congenital coalitions is failure of complete segmentation of mesenchyme with the absence of normal joint formation. Approximately 50%–80% of cases of tarsal coalition are bilateral [2] and more than 90% of coalitions are located between the calcaneus and the navicular or between the talus and calcaneus [3]. Calcaneonavicular and talocalcaneal coalitions have been reported to occur in approximately equal frequency [4]. However, recent investigations suggest that calcaneonavicular coalitions occur 3 times more frequently [5].

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Case 1:-

We present a case of a 26 years old shepherd woman from mountainous belt of Jammu region with an 8 years old history of symptoms initially mild and progressive in nature. Patient complained of pain over a period of 7-8 years initially starting as dull ache on walking during cattle rearing more severe at the end of the day. The pain was in the right foot and predominantly along the dorsum of right foot. The patient ignored the pain for 2-3 years. Local quacks advised hot compresses which gave temporary relief to the patient. However the patient complained of pain increasing in severity and duration over the following years. 3 years back a local chemist prescribed her steroids with which she felt relief and miraculous feeling of well being for about 3 months. Thereafter she discontinued the medication due to poor compliance, ignorant outlook and continuous expenditure.

Thereafter the symptoms worsened with severe pain and frequent episodes, inability to perform daily work and mountain climbing. The patient then paid a visit to the District Hospital where radiograph was taken and patient was diagnosed as osteoarthritis. Also other tests which included routine blood tests, serum uric acid levels and rheumatoid factor were performed. The tests came out to be normal and negative for rheumatoid factor making the case difficult.

The patient was referred to Government Medical College Jammu with a symptomatic initial medication for pain relief. On examination the patient had moderate pes planus and moderate rear foot valgus on static observation. She walked with mild right forefoot abduction, right side restricted dorsiflexion, inversion and Eversion was seen. Plantar flexion was full and pain free. Passive inversion caused sharp pain posterior to the medial malleolus on the right. Motion palpation of the subtalar joint was significantly limited on right side, particularly in eversion. Resisted range of motion was full and pain free. Pain on palpation was non-specific, in the region of the talus on right side.

All existing imaging was requested from the patient. Due to evaluation at a District centre a digital radiograph was not available which was requested at our department.

Upon evaluation of the lateral view of the feet, left foot radiograph was normal. Minimal degenerative changes were seen plain films. Evaluation of right foot revealed an abnormal cortical confluence extending from the talus to the sustentaculum tali. This radiographic finding has been termed the "C" sign and is suggestive of talocalcaneal coalition (Fig.1). Talar Beak Sign was seen on lateral radiograph (Fig. 2) at anterior aspect of talus. Also marked sclerosis of articular surfaces was seen on radiograph on right side. The findings had been overlooked on previous radiograph

On discussion with the orthopaedician working up the case with findings of pes planus right foot a CT scan was performed in our Department with 3D reformation. The CT Scan revealed bony talocalcaneal coalition at mid facet, with marked sclerosis of articular surfaces and reduced talocalcaneal joint space. Anterior Talar beaking with osteophytosis was noted predominantly involving talus and navicular joint. Irregular articular contours, narrowed joint space with sclerosis in the middle subtalar joints were noted (Fig. 3-8). The orthopaedic department agreed with the image findings and interpretation. The patient was explained about the condition, surgical treatment and outcome. However the patient was not convinced about the surgical treatment due to lack of monetary support.

Case 2:-

The second case is that of a 15 years male presenting with pain and swelling over the medial aspect of left ankle over a period of one year. Pain worsened on walking and running. Painful sideways movement of the ankle was noted. Physical examination revealed swelling over medial malleolus with painful inversion and eversion and tenderness over posterior aspect of ankle. Radiographs revealed subtle 'C' sign and early osteophyte formation. CT Scan was performed and revealed talocalcaneal coalition which was bony and visualised on coronal images clearly along with osteophyte formation and edematous soft tissue swelling over medial malleolus. Coalition was resected with insertion of bone wax to prevent further bone fusion. Patient is on regular follow up and getting better as per the orthopaedician.

Case 3:-

This case reports a 17 year old girl with bilateral foot pain and severe pain while walking on uneven surfaces. Inversion and eversion were particularly painful. There was no previous history of trauma.

CT Scan revealed bony outgrowths projecting from medial aspect of talus and sustentaculum tali impinging on flexor tendons. Patient however was not convinced regarding the surgery as informed by orthopaedician.



Figure 1: AP radiograph of the ankle showing Talocalcaneal coalition evident by sclerosis of the apposing talocalcaneal margins and sclerosis of these margins.



Figure 2: Lateral radiograph of the ankle showing the talocalcaneal coalition.



Figure 3: CT Scan-sagittal reformation (volumetric image-VRT) with anterior talar beaking with sclerosis and talocalcaneal coalition at midfacet and reduced talocalcaneal joint space.



Figure 4: CT Scan sagittal reformation showing reduced talocalcaneal joint space and sclerosis of the adjoining margins and arthrosis.



Figure 5: Sagittal Reformation showing talocalcaneal fusion in the mid-facet region.



Figure 6: CT Scan coronal Reformation reveals talocalcaneal coalition with sclerosis.



Figure 7: Axial reformatted image showing the talocalcaneal coalition.



Figure 8: Maximum intensity projection showing the talocalcaneal coalition..

Discussion:-

Coalitions are usually fibrous or cartilaginous at birth, but many begin to ossify in late childhood [6]. Therefore, the pathogenesis of tarsal coalitions is best viewed as a spectrum of pathology with progressive ossification representing increasing severity of the condition. Many individuals with tarsal coalition remain asymptomatic throughout their life [7]. It is suspected that biomechanical stress through physical activity may explain the progression of the spectrum of pathology. With repetitive microfracturing and remodelling the coalition progressively becomes more osseous, resulting in increasing rigidity and evolving histological changes at the coalition site. This progressive ossification contributes to increasing pain sensitive structures at the coalition site, and also contributes to pain in joints surrounding the coalition due to biomechanical compensations. Patients with tarsal coalition most commonly present with hindfoot pain and stiffness [8]. The pain is generally reported in the region of the subtalar or talonavicular joint. The patient in this case 1 first presented with right dorsal foot pain. The pain was located in the region of the talus, but not specifically confined to the talonavicular joint. She also noted

Occasional sharp pain posterior to the medial malleolus that was recreated with passive inversion in the physical examination. She eventually started experiencing progressing hindfoot pain after the onset of dorsal foot pain. The vague symptomatology in this case may have contributed the confusion and delay in an accurate diagnosis at was worse after activity. Limited hindfoot mobility, specifically subtalar inversion and eversion in all the three cases, is the most common physical examination finding in patients with talocalcaneal coalition.

The patients reported subjective stiffness confirmed with observable limitation with these movements. Patients may also present with a rigid planovalgus foot, also called peroneal spastic flat foot, however this occurs in a minority of patients and not the majority as often cited in early publications on tarsal coalition. Our CASE 1 did present with moderate pes planus and moderate rear foot valgus. The majority of symptomatic talocalcaneal coalition patients present clinically between 12 and 16 years of age. Our patients also presented in this age group.

Patients with tarsal coalition often present clinically after traumatic injury [9]. Ankle sprains have been reported by many authors as a complication. However our patients did not have any history of trauma.

X-rays of the foot should be the first imaging modality selected for patients with suspected tarsal coalition. Crim et al concluded that routine anterior-posterior and lateral x-rays are a sensitive screening test for both talocalcaneal and calcaneonavicular coalitions [10]. The review by Newman and Newberg and the study by Crim et al provide an excellent evaluation of the key radiographic signs practitioners should be looking for in cases of suspected tarsal coalition. Crim et al determined that the most accurate radiographic signs for diagnosing talocalcaneal coalition are the C-sign and talar beaking visualized on lateral views of the foot. Absent visibility of the subtalar facets [usually middle subtalar facet] and a dysmorphic sustentaculum tali are also helpful in diagnosing talocalcaneal coalition on a lateral x-ray of the foot, However the accuracy of these signs can be confounded by the direction of the x-ray beam [11]. Axial and coronal CT images are considered the current imaging gold standard for diagnosing tarsal coalition. Many authors have speculated that MRI is more accurate at visualizing non-osseous coalitions. However, in a blinded prospective investigation Emery et al concluded although MRI has a high rate of agreement with CT, it is not superior in detecting non-osseous coalitions [12]. None of our patients underwent an MRI. CT findings for complete tarsal coalition are the presence of an osseous bar between tarsal bones. The more common incomplete coalitions are demonstrated by articular narrowing with subchondral sclerosis or cystic changes

There is a lack of evidence for outcomes in conservatively managed cases of tarsal coalition. Expert opinion suggests that conservative measures may be adequate in less progressed cases of coalition, where symptoms are tolerable and non-disabling. Conservative treatment options that have been proposed for symptom management are modifying activity level, cold compresses, NSAIDs and therapeutic modalities or a trial of care with supportive devices such as hard soled shoes, foot orthoses, ankle stabilizing orthoses or a short-leg cast.

Surgical resection of the coalition has received the most attention in the literature, with orthopaedic case series' reporting successful short term [mean post-surgical follow up of 1 to 5 years] outcomes ranging from 50–94% of cases [13]. Positive prognostic factors for surgical resection of a coalition include minimal joint space involvement [less than 50%], higher fibrous or cartilaginous content, non-skeletally mature patients, lack of secondary osteoarthritis changes and minimal rear foot valgus [less than 16 degrees]. Our cases 1 and 3 are a

bony/osseous tarsal coalition and did not show keenness on surgical option due to low socioeconomic status and explained possibility of unsatisfactory outcome. Case 2 underwent surgical resection with satisfactory results.

Conclusion:-

Tarsal coalition is an often overlooked cause of pain in adolescents that present with foot pain. We report three diagnostic cases diagnosed with talocalcaneal coalition after few missed and overlooked diagnosis particularly in Case 1.

Although tarsal coalition is an imaging based diagnosis that often results in orthopedic management, our case highlights the necessity for all primary care practitioners and radiologists responsible for diagnosing and managing foot pain to keep in mind of the key diagnostic features of talocalcaneal coalition and the possibility of its occurrence particularly in patients with unilateral pes planus in age group of 14 to 17 years. Early recognition and treatment may show better results in younger patients.

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