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Tibio Fibular Synostosis - A Case Report

KEYWORDS: Tibio fibular diaphyseal synostosis, Post - traumatic , Callus.

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ABSTRACT *We report a case with tibio fibular diaphyseal synostosis . During routine osteology teaching section for first year MBBS , a bone showing tibio fibular diaphyseal synostosis was noticed in the department of Anatomy , Sri Ramachandra Medical College and Research Institute, Chennai . The history and the symptoms experienced by the individual were unknown . The provisional diagnosis in this case could be a post - traumatic tibio fibular synostosis because callus formation was evident at the site of synostosis . The relevant medical history of the present case was not in records .*

INTRODUCTION

Osseous union between bones that are normally seperate is known as synostosis[1].Tibio fibular synostosis is abnormal union of tibia and fibula by the ossification of interosseous membrane. We report a case of tibio fibular synostosis for its rarity.

CASE REPORT

A bone showing tibio fibular synostosis was found during demonstration of bones to the students in our department .On observation the bones were identified as left sided. The tibia and fibula were apparently having normal morphology except in the middle where they show an area of union and callus formation. The location of tibio fibular synostosis was in the middle region for about 6 cms in length.

The bone specimen picture is given as figure:1 showing tibio fibular synostosis and the x ray picture is given as figure:2(lateral view),figure: 3(anteroposterior view). The observations are evident in figure 1 ,figure 2 and figure 3 .

Figure 1: Anterior view of the left tibia and fibula showing tibio fibular synostosis

Figure2: Full length Lateral view Radiograph of the bone specimen showing Tibio fibular Synostosis

1 - Fibula
2 - Tibia
3 - Callus
4 - Synostosis

Figure3: Full length Anteroposterior View Radiograph of the bone specimen showing Tibio fibular Synostosis.

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The relevant medical history was not traceable from the available records.The union was quiet dense enough and unbreakable manually. At the same level on the medial side of tibia, there was a smooth bony elevation which strongly indicates the callus formation. The X ray analysis of the specimen has been done in radiology department and the x ray report revealed benign peri – osteal reaction at mid – shaft level of tibia and fibula. Callus formation was noted at mid – shaft level of tibia and fibula causing pseudoarthrosis.

DISCUSSION

Tibio fibular joints are classified into superiortibio fibular joint, middle tibio fibular joint and inferior tibio fibular joint. Middle tibio fibular joint is a fibrous joint and is formed by the crural interosseous membrane connecting the interosseous borders of shafts of both tibia and fibula[2]. Traced below, the membrane is continuous with the interosseous ligament of inferior tibio fibular joint[2]. Upper border of interosseous membrane is free, above which the anterior tibial vessels pass in the anterior crural region along the medial side of neck of fibula[2]. A little above the inferior tibio fibular joint, the membrane is pierced by perforating branch of peroneal artery[2]. Most of the fibres of the interosseous membrane are directed downward and laterally, except in the upper part where they are directed medially and downward[2].

The etiology of tibio fibular synostosis are congenital associated with leg length discrepancy, bowing of fibula or valgus deformity of the knee[3]; post traumatic following fracture of tibia, ankle sprain with disruption of the interosseous membrane; post surgical following tibial nailing, osteotomy[4]. The most common identifiable etiology is post traumatic tibio fibular synostosis.

The patho physiological mechanism behind is following trauma, severe hematoma occurs over the fracture line, which extends over the interosseous membrane and gets calcified resulting in callus formation[4]. Following injury to soft tissues, haemorrhage across interosseous membrane results in ossification of tibia and fibula[4].

Not much of study pertaining to this literature is available; however the presence of callus formation indicates the post traumatic etiology for the synostosis in the present case.

Normal downward movement of fibula helps to deepen the ankle mortise and tighten the interosseous membrane. Tibio fibular synostosis prevent normal fibula descent and lateral rotation resulting in chronic ankle pain and limited ankle dorsiflexion. Any disruption of normal anatomy at one end can affect the function at the other end, this basic principle is missed when ankle radiograph is alone taken[5]. So anteroposterior, lateral and mortise view of ankle joint, antero-posterior, lateral view of entire length of tibia and fibula are to be taken for early diagnosis.Bone scan should be taken to verify that ossification is complete. MRI scan helps to rule out neoplastic changes and its relation to neurovascular structures.

After maturation of synostosis, simple excision of synostosis or fibular osteotomy gives good symptomatic relief. During fibular osteotomy, care to be taken in the region 70mm to 150mm from fibular head to prevent injury of peroneal nerve branching to extensor hallucis longus tendon[5]. Interposing muscle or silastic material along with bone wax are used to prevent recurrence. Adjunctive post operative low dose irradiation prevent recurrence[6]. Custom moulded orthotic shoes are also preferred.

CONCLUSION

Understanding the surgical anatomy of tibio fibular joints and awareness of synostosis will be of considerable help for efficient surgical intervention and post-operative management.The tibio fibular synostosis may prevent normal ankle functionwhich may lead to persistent ankle pain. Tibio fibular synostosis is of vital importance in persistent ankle problems. Due to its effect over limb length and alignment, this condition should be diagnosed early. Hence the knowledge of complete examination of tibia and fibula as single unit helps the surgeon to diagnose the cause of chronic ankle pain and treat promptly.

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