

## Case Report

### An Incidental Finding Of Post Traumatic Diaphyseal Tibiofibular Synostosis – A Case Report.

**Khizer Hussain Afroze M<sup>1</sup>, Sangeeta M<sup>2\*</sup>, Umesh S M<sup>3</sup>.**

1&3. Assistant professor, Department of Anatomy, MVJ Medical College and Research Hospital, Hoskote, Bangalore.

2. Professor & HOD, Department of Anatomy, MVJ Medical College and Research Hospital, Hoskote, Bangalore.

## Abstract

Tibio-fibular synostosis is a rare, limb malformation characterized by fusion of the proximal or distal tibial and fibular metaphysis and/or diaphysis. The present case was an incidental finding in the Osteology section of the Anatomy Museum. We report a rare case of tibiofibular synostosis, reported occasionally in the Indian population. The left tibia and fibula were malunited by the synostotic segment of bone at the junction of the middle and lower 1/3rd of the bones. It is imperative for orthopedic surgeons to follow up postoperative leg cases radiologically and evaluate cases with leg and ankle pain keeping this entity in mind.

**Keywords:** Tibiofibular synostosis, Post traumatic ossification, Diaphysis.

## Introduction

Tibiofibular synostosis is a rare clinical occurrence characterized by adhesion of the proximal or distal tibial and fibular metaphysis and/or diaphysis. It may be associated with distal positioning of the proximal tibiofibular joint, shortening of limb, and valgus deformity of the knee.<sup>1</sup> Proximal tibiofibular synostosis is associated with a congenital etiology and presents as growth deformities as listed above while Distal ones are acquired either following trauma or as postoperative complications.<sup>2</sup> In this paper we discuss case of Tibiofibular synostosis involving middle third and lower third diaphyseal segments of tibia and fibula discovered incidentally in the Anatomy museum and its clinical implications.

## Case Report

The present case was discovered as the incidental finding from the Osteology section of the Museum, MVJ Medical College and Research Hospital. The left tibia and fibula were malunited by synostotic segment of bone at the junction of middle 1/3<sup>rd</sup> and lower 1/3<sup>rd</sup> of the bones. The measurement of the synostotic segment was recorded by using vernier calipers and length of the leg bones were recorded using flexible steel tape. The length, breadth and thickness of synostotic segment as measured in this specimen were found to be 17.2 mm, 16.0 mm and 14.2 mm respectively. The maximum length of tibia and fibula were found to be 31 cm and 29cm respectively. The proximal as well as distal tibiofibular joints were found normal.

History of the present case was not available since this specimen discovered was an incidental case, hence the etiology can only be hypothesized as post traumatic due to the following observations. The tibia was deformed at the junction of middle 1/3<sup>rd</sup> and lower 1/3<sup>rd</sup> which is evident by callus formation in the middle third. The distal fragment of fibula has malunited with shaft of the tibia distal to the callus formation in the tibia (Figure 1).

## \*Corresponding Author

**Dr. Sangeeta M**

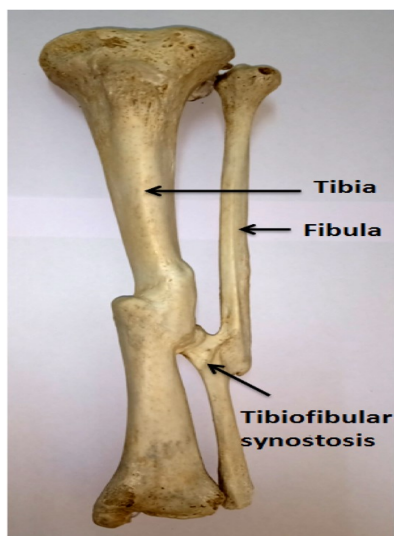
Professor & HOD, Department of Anatomy,  
MVJ Medical College and Research Hospital, Hoskote,  
Bangalore.

Mobile No : 9731936362

E-mail: sangeetaanatomy@gmail.com

Conflict of Interest: None

Financial Aid: Nil



**Figure 1:** Left tibia and Fibula (Anterior View) showing tibiofibular synostosis.<sup>1</sup>

## Discussion

Abnormal union between adjacent bones or parts of single bone composed of either cartilage, osseous material or fibrous tissue constitutes a synostosis.<sup>3</sup> Heterotopic ossification can manifest in many form like Rider's bone, myositis ossificans and synostosis.<sup>2</sup> Tibiofibular synostosis may involve proximal, middle or distal segment of the bones. Proximal synostosis are usually congenital while distal ones are acquired except those associated with multiple hereditary exostoses. Congenital synostosis usually presents as growth deformities if synostosis occurs prior to epiphyseal fusion. The embryological basis of congenital synostosis is attributed to the persistence of incomplete separation of cartilage common to tibia and fibula.<sup>3</sup>

Acquired ones could have the following etiologies - Post traumatic e.g. following stress injuries or fracture causing hematoma formation which may eventually get ossified.<sup>3,4</sup> Iatrogenic causes following nailing and osteotomy for tibial fracture reduction leading to intraoperative soft tissue injury causing bleeding or subperiosteal dissection across interosseus membrane resulting in osteogenesis.<sup>3,4</sup>

Symptoms may range from anterior compartment pain syndrome, ankle pain with restricted range of motion, peroneal neuropathy, and valgus deformity of ankle. Few cases are asymptomatic and discovered incidentally.<sup>5</sup>

Since the tibia and fibula are united by three joints acting as a single unit, synostosis at any point may interfere with the normal biomechanics of these joints as happens during weight bearing. The distal tibiofibular synostosis may prevent the descent of fibula during mid-stance and pre-swing phase of the gait as reported by Fu et al. It may also lead to compression of

anterior peroneal vessels during their passage through lower part of the interosseous membrane which connects tibia and fibula.<sup>2</sup>

Since the present case was discovered as an incidental finding, no history was available. Hence it can only be hypothesized that the etiology behind this could possibly be a malunion associated with synostosis following fracture of tibia and fibula. X-ray is the cornerstone of diagnosis. It can be supplemented by CT, MRI and bone scan wherever required. Both limbs should be radiographed.

Asymptomatic cases do not require treatment. Conservative treatment approaches include rest, cold water fomentation, NSAIDs and ultrasound-guided steroid injection. Operative treatment is recommended for symptomatic cases with surgical resection of the synostotic segment or osteotomy of the synostotic segment. Operative treatment is to be carried out only when callus has matured in congenital tibiofibular synostosis since a high recurrence rate is noted otherwise.<sup>6</sup>

## Conclusion

To conclude, Tibiofibular synostosis presents with a wide clinical spectrum from being asymptomatic to causing growth deformities. Hence it is imperative for orthopedic surgeons to follow up postoperative leg cases radiologically and evaluate cases with leg and ankle pain keeping this entity in mind.

## Conflict of Interest

No conflict of interest was declared by the authors.

**Financial Disclosure:** Nil

## References

1. Prachi S A, Manish A, Kuldip SS, Shweta A. Bilaterally symmetrical tibiofibular synostosis – A rare incidental finding. *IJBR* 2013;4(6):292-295.
2. Owofe O, Oyedun OS. Distal tibiofibular synostosis in a Nigerian: a case report. *Int J Biol Chem Sci* 2015 23; 9(2):1078-81.
3. Umesan KG. An abnormal bony union between leg bones. *IJCRI* 2013; 4(6):334-336.
4. Sferopoulos NF. Tibiofibular Synostosis. *ARC Journal of Orthopedics* 2018;3(1):5-10
5. Anas IY, Esomonu UG, Dimitrov ND, Rabiou IF, Saleh MS. Posttraumatic tibiofibula synostosis of the distal 1/3 of the leg: a case study. *BAJOPAS* 2009; 2(2): 31 – 33.
6. Tiwari S, Roopashree R, Padmavathi G, Sangeeta M. Proximal Tibiofibular Synostosis and its Clinical Significance: A Case Report. *Int J Med Res Rev* 2014;2(2):163-165.