



## Lunotriquetral Coalition

Ayşe Umul<sup>1\*</sup>

<sup>1</sup>Department of Radiology, Süleyman Demirel University, Faculty of Medicine, Isparta, Turkey.

### Author's contribution

The sole author designed, analyzed and interpreted and prepared the manuscript.

### Article Information

DOI: 10.9734/BJMMR/2016/19864

#### Editor(s):

(1) Franciszek Burdan, Experimental Teratology Unit, Human Anatomy Department, Medical University of Lublin, Poland and Radiology Department, St. John's Cancer Center, Poland.

#### Reviewers:

(1) Anonymous, University Hospital Center Sisters of Mercy, Zagreb, Croatia.

(2) Fatima Mubarak, Aga Khan University Hospital, Karachi, Pakistan.

(3) Arturo Solis Herrera, Human Photosynthesis® Study Center, Mexico.

Complete Peer review History: <http://sciencedomain.org/review-history/12715>

### Case Study

Received 30<sup>th</sup> June 2015  
Accepted 22<sup>nd</sup> August 2015  
Published 17<sup>th</sup> December 2015

## ABSTRACT

Carpal coalition is a rare asymptomatic condition and usually detected incidentally. It may be symptomatic after a trauma and causes pain on the medial part of the wrist. Most often, lunotriquetral coalition is seen. The second frequent one is capitate-hamate coalition. It can be seen as an isolated entity or as a part of a congenital anomaly. Four radiological sub-types have been determined. In this article, we present a 20-year-old male patient with type 2 lunotriquetral coalition diagnosed with left wrist MRI, who was presumed as tendinitis.

*Keywords: Carpal; coalition; incidental.*

## 1. INTRODUCTION

Carpal coalition is a rare asymptomatic clinical entity. Carpal coalition follows an autosomal dominant mode of inheritance [1-3]. Lunotriquetral coalition is the most obvious sub-type [2,3]. In the present case, our aim is to present MRI imaging findings of a type 2 lunotriquetral coalition case and to discuss radiological sub-types.

## 2. CASE

A twenty-years-old male patient presented with right ulnar wrist pain. There was no history of trauma. There was no swelling at the wrist. Magnetic resonance imaging (MRI) of the right wrist was performed with the pre-diagnosis of tendinitis. MR examination is performed on a Siemens Magnetom Avanto MR Syngo at 1.5 T (Siemens Medical Solutions, Erlangen,

\*Corresponding author: Email: [ayseumul@gmail.com](mailto:ayseumul@gmail.com);

Germany). T1 and T2 weighted fast spin echo (FSE) and gradient echo (GE) images showed that complete osseous fusion between triquetrum and lunate, with a distal notch (Fig. 1). According to Minnaar de Villiers classification, it has been diagnosed as type 2 lunotriquetral coalition. A tendon pathology was not detected. Coalition was considered to be the cause of the ulnar wrist pain. Conservative management of this clinical entity was planned.

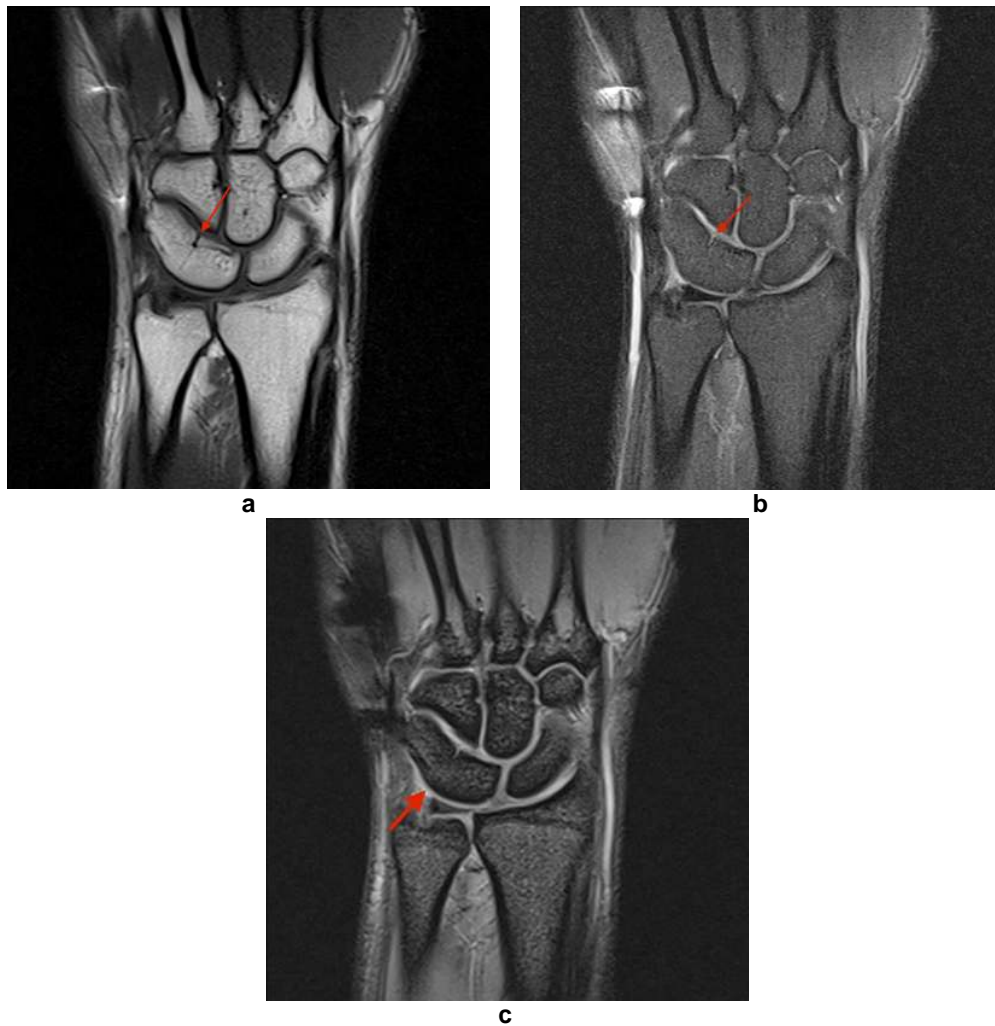
### 3. DISCUSSION

Carpal coalitions may be symptomatic following trauma and may cause ulnar wrist pain. Lunotriquetral coalition is the most obvious subtype such as our case [2,3]. Capitate-hamate coalition is the latter frequent type [2,3]. It has

been observed two times more common in women [4], but this article describes a case of men. The incidence is higher in African [1,5].

Congenital carpal coalition develops due to absence of cavitation at the potential joint location between 4th to 8th weeks of intrauterine development [1,2,3,6].

Carpal coalition, can be seen as an isolated condition or a part of a congenital anomaly such as Steel syndrome, Muenk syndrome, congenital spondilism, spondilocarpotarsal synostosis syndrome and arthrogryposis multiplex congenita [1]. Only two bones make a coalition in the isolated form, however more than two bones join to the coalition in the syndromic version [7,8].



**Fig. 1. Coronal T1A (a), Coronal gradient echo (GE) (b) and Coronal fat-saturated T2A (c) images; there is complete osseous fusion between triquetrum and lunate, with the distal notch (arrow)**

Lunotriquetral coalitions, do not cause loss of function, but the lack of intra-articular cartilage may predispose to degenerative arthritic changes [1].

Lunotriquetral coalitions were classified into four radiological types by Minnaar de Villiers [9]. Type 3 is the most common, type 2 is the latter one [10,11].

In type 1 coalition, also called fibrocartilage coalition, incomplete fusion is present, pseudoarthrosis occurs, and it causes ulnar-sided pain [5,10].

In type 2, incomplete osseous fusion, stable proximal fusion and distal notch are observed such as our case.

In type 3, there is complete osseous fusion between lunatum and triquetrum. There is no movement in the affected bones, therefore it is usually asymptomatic. In the follow-up period, degenerative arthritic changes may develop [1].

In type 4, a complete osseous fusion and other carpal anomalies are detected.

AP and lateral radiographs are usually sufficient for the diagnosis. Expansion of the scafo-lunat joint space has been found to be associated with luno-triquetral coalition [12], however we have not detected this finding in our case.

Computed tomography (CT); may provide more information about bone surfaces and degree of fusion, especially in asymptomatic patients.

Magnetic resonance imaging (MRI); can be performed to exclude accompanying soft tissue pathologies, such as tendinitis in present case, and may be helpful for preoperative evaluation. MRI provides more accurate information about the coalition if there is osseous fusion or not. Coronal images are useful.

Treatment options are conservative management or surgical approach. The choice depends on patients' symptoms and whether the coalition is complete or incomplete [13,14]. Conservative management includes elevation, immobilization and anti-inflammatory drugs [8,14,15]. Partial arthrodesis procedure can be applied for patients requiring surgical intervention [7].

#### 4. CONCLUSION

carpal coalition is usually asymptomatic, however symptoms may emerge. There is a tendency for

development of degenerative arthritis in these patients. Radiographs, CT and MRI are useful for diagnosis. Conservative management or surgical approach can be performed.

#### CONSENT

A written informed consent was obtained from the patient.

#### ETHICAL APPROVAL

It is not applicable.

#### COMPETING INTERESTS

Author has declared that no competing interests exist.

#### REFERENCES

1. Singh P, Tuli A, Choudhry R, Mangal A. Inter- carpal fusion—A review. *Journal of the Anatomical Society of India*. 2003; 52:183-188.
2. O'Rahilly R. A survey of carpal and tarsal anomalies. *The Journal of Bone & Joint Surgery*. 1953;35:626-642.
3. Delaney TJ, Eswar S. Carpal coalitions. *Journal of Hand Surgery*. 1992;17:28-31.
4. Ozyurek S, Guler F, Canbora K, Kose Ö. Asymptomatic lunotriquetral coalition: An incidental radiographic finding. *BMJ Case Rep*; 2013. DOI:10.1136/bcr-2013-009429
5. Resnik C, Grizzard JD, Simmons BP, Yaghami I. Incomplete carpal coalition. *American Journal of Roentgenology*. 1986;147:301-304.
6. Moore KL, Persaud TVN, Torchia MG. *The developing human: Clinically oriented embryology*. 8th ed. Philadelphia, PA: Saunders/ Elsevier; 2008
7. Weinzweig J, Kirk Watson H, Herbert TJ, d Shaer JA. Congenital synchondrosis of the scaphotrapezio- trapezoidal joint. *Journal of Hand Surgery*. 1997;22:74-77.
8. Knezevich S, Gottesman M. Symptomatic scapho- lunatotriquetral carpal coalition with fusion of the capi- tometacarpal joint. *Clinical Orthopedics*. 1990;251:153-156.
9. Minnaar de Villiers AB. Congenital fusion of the lu-nate and triquetral bones in the South African Bantu. *The Journal of Bone & Joint Surgery*. 1952;34B:45-48.
10. Sy MH, Diarra O, Diagne M, Diouf MM, Sene P, Diouf S. Pyramido-lunar fusion in

- black Africans. Ann Radiol (Paris). 1996;39:208-12.
11. De Villiers Minaar AB. Congenital fusion of the lunate and triquetral bones in the South African Bantu. J Bone Joint Surg. 1952;34:45-8.
  12. Metz VM, Schimmerl SM, Gilula LA, Viegas SF, Saffar P. Wide scapholunate joint space in lunotriquetral coalition: A normal variant? Radiology. 1993;188(2): 557-9.
  13. Smith-Hoefer E, Szabo RM. Isolated carpal syn- chondrosis of the scaphoid and Trapezium. The Journal of Bone & Joint Surgery. 1985;67:318-320.
  14. Tsionos L, Drapé JL, Le Viet D. Bilateral pisi-form-hamate coalition causing carpal tunnel syndrome and tendon attrition. A Case Report. Acta Orthopae-dica Belgica. 2004;70:171-176.
  15. Peters S, Colaris J. Carpal coalition: Symptomatic incomplete bony coalition of the capitate and trapezoid— case report. Journal of Hand Surgery. 2011;36:1313-1315.

---

© 2016 Umul; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

*Peer-review history:*  
*The peer review history for this paper can be accessed here:*  
<http://sciencedomain.org/review-history/12715>