

Congenital Bipartite Scaphoide : A Case Report

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CO, LM: Conceptualization, clinical and imaging data, writing and editing

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Consent: Yes

ABSTRACT

Congenital bipartite scaphoid is an extremely rare developmental anomaly of the carpus that has been well documented in medical literature [1]. We report the case of a 45-year-old man who was found to have a bipartite scaphoid, without any notion of trauma or clinical symptoms. Diagnosis retained on a CT scan.

CASE REPORT

BACKGROUND

This case report illustrates the case of a bipartite scaphoid, a rare entity that must be taken into consideration, as it can be confused with a fracture line, hence the importance of differentiating between the two, knowing that they have two different management approaches, thus avoiding dreadful complications.

CASE REPORT

A 45-year-old patient, right-handed, with no notion of previous trauma, admitted to the emergency department with right wrist trauma following a fall. Standard radiographs of the right wrist from the front showed a continuous carpal scaphoid.

DISCUSSION

Etiology & demographics

The carpal bones are cartilaginous at birth and then develop a central center of ossification that starts in the hamate and capitate. Lunates generally begin to ossify between the ages of 2 to 4. This single center of ossification enlarges to form adult lunates between the ages of 12 and 14. Each carpal bone is ossified from one ossification center. Scaphoid and hamate,

however, may have 2 or more centers of ossification and therefore be bipartite in some cases [2].

Duplicate scaphoid ossification centers are uncommon but have been described. Whether these go on to form an adult bipartite scaphoid has been debated. Some believe that congenital bipartite scaphoid rather represents a pseudoarthrosis following scaphoid fracture non-union.

Congenital bipartite scaphoid was first described by Gruber in 1877, who identified four examples in 3007 anatomical dissections. These findings were supported by Pfitzner (Pfitzner, 1895) who reported nine congenital bipartite scaphoid specimens in 1456 dissections. Bunnell (Boyes,1970), in his 1944 book *Bunnell's Surgery of the Hand* proposed several features that make a bipartite scaphoid more likely to be developmental rather than traumatic in origin [3].

Clinical & Imaging findings

In diagnosis of the congenital bipartite scaphoid, Bunnell listed the following five criteria: the absence of a history of trauma; the presence of bilateral scaphoid bipartition; equal size and density of both parts; the absence of degenerative changes

between the two components of the scaphoid or elsewhere in the wrist; smooth and gently rounded components of each part of the scaphoid [4].

Other complementary criteria are mentioned in the literature are: absence of clinical symptoms, normal height of the carpus verifying the absence of intracarpal collapse, presence of cartilage between the two fragments, generally proven by MRI [5].

The radiological diagnosis of a bipartite scaphoid can be made on wrist X-rays before the carpus has ossified: in children, the ossification nucleus of the scaphoid appears at around five to six years of age, earlier in girls than in boys, and is located in the middle third of the future bone, equidistant between the lunate and the trapezium: when there is a bipartite scaphoid, the first ossification nucleus to appear is located at the distal pole, with the proximal pole ossifying secondarily [5].

A comparative study has demonstrated the existence of morphometrical and morphological features shared by the os centrale in each specimen: [7].

1- The os centrale is smaller than the scaphoid. Its shape is elongated in the anteroposterior scaphoid direction.

2- The position of the os centrale is always distal compared to the scaphoid according to the proximodistal axis.

3- The main morphological feature of the bipartite scaphoid derived from the remnant os centrale is continuity of the scaphoid from the proximal to the distal pole along the z-axis, which is distinct from pseudarthrosis, fracture, and also the rare coronal fracture of the scaphoid. In human specimens, if the os centrale is removed, the scaphoid still appears normal and whole. In scaphoid fractures or pseudarthrosis (non-union), if one fragment is removed, the scaphoid appears deformed and too short.

Differential diagnosis

Diagnostic differentiation between a bipartite carpal scaphoid and non-union could be very important, so that unnecessary immobilization and surgery can be avoided. The accurate recognition of the condition would be useful in order to avoid inappropriate assessment for compensation as indicated by Sherbok and Grogan [1].

Cases of bipartite scaphoid with radiocarpal arthritis are related to scaphoid pseudarthrosis [7].

Evolution

The osteoarthritic evolution of this anomaly cannot be excluded, hence the importance of radiological monitoring using the McMurthy index modified by Natras [6].

TEACHING POINT

Congenital bi-part scaphoid is a rare condition, causing confusion with a fracture, which why it is important to use imaging to make a diagnosis based on several criteria

QUESTIONS

Question 1: What are the characteristics of a bipartite scaphoid?

1. Irregular contours of both parts of the scaphoid
2. Regular contours of both edges of the scaphoid (applies)
3. Notion of trauma
4. Swelling of wrist soft tissues

Explanation:

The scaphoide bipartite is characterized by absence of clinical symptoms and absence notion of trauma, on imaging, the regular, smooth contours of the edges are more suggestive of a bipartite scaphoid than a fracture line.

Question 2: How to differentiate between bipartite scaphoid and fracture line?

1. Guide therapeutic management (applies)
2. Helps avoid secondary pseudoarthrosis (applies)
3. Has no impact on follow-up or joint prognosis
4. Not important to know on imaging

Explanation:

Diagnostic differentiation between a bipartite carpal scaphoid and non-union could be very important, so that unnecessary immobilization and surgery can be avoided. The accurate recognition of the condition would be useful in order to avoid inappropriate assessment for compensation as indicated by Sherbok and Grogan

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FIGURES

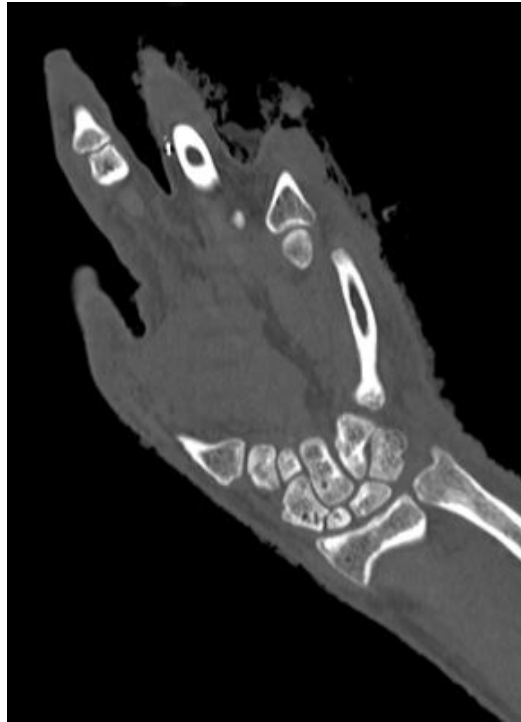


Figure 1: Coronal section scanner nonfractured wrist joint. This scaphoid is divided. The margins of both portions in the wrist are round and smooth



Figure 2: 3D reconstruction images of the wrists at the proximal carpal row. scaphoid is divided into 2 parts. Margins of the palmar and dorsal parts are smooth and corticalized. The divided scaphoid are well aligned with each other and with the joint surfaces of the radius and the lunate.

KEYWORDS

scaphoide, bipartite, congenital

ABBREVIATIONS

CT SCAN = COMPUTES TOMOGRAPHY SCAN

MRI = MAGNETIC RESONANCE IMAGING

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