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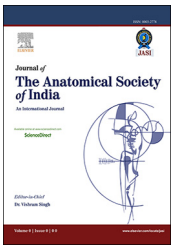

Case Report

Intra-articular accessory cartilage fragments in fossa olecrani☆

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ABSTRACT

Elbow injuries are common, diverse and very painful. They can affect the muscles and the neurovascular bundle, as well as, the elbow joint itself (articulatio cubiti).
Objective: To present a case of the anatomical variation cartilago supratrochlearis dorsalis.
Materials and methods: The classical layered dissection method was used during the education of students at the Medical University of Plovdiv, Department of Anatomy, Histology and Embryology.
Results: A deformed circumferentia articularis radii with a 9 mm in diameter erosion in fovea capitis radii. Fossa olecrani has a preserved form and size and contains three accessorious, flat, well confined, hard formations – rhombus-shaped (5/4 mm), elliptical-shaped (4/2 mm), bisegmented with an irregular shape (6/4 mm). No pathologies of the olecranon were identified.

Besides the typical chondrocytes, no inflammatory cells were found – plasma cells, histiocytes and foreign-body cells. The connective tissue matrix is not homogeneous. No signs of ossification are found.

1. Introduction

Elbow injuries are common, diverse and very painful. They can affect the muscles and the neurovascular bundle, as well as, the elbow joint itself (articulatio cubiti). It is a complex joint, composed of the humerus, ulna and the radius connected through three simple joints – the humeroulnar, humeroradial and the proximal radioulnar. The simple joints share a cavity and a loose capsule which is attached proximally from fossa coronoidea and fossa radialis and covers the distal part of fossa olecrani. Medially and distally, it is attached near the epicondyls of the humerus, but they remain outside the joint cavity. The joint capsule attaches to the ulna at the edge of the articular surfaces, and to the neck of the radius through ligamentum annulare radii. The joint is strengthened by four ligaments – two collateral ligamanets (ligamentum collaterale ulnare and radiale), ligamentum annulare radii and ligamentum quadratum. Ligmanent collaterale ulnare begins from the medial epicondyl of the humerus and fans downwards to

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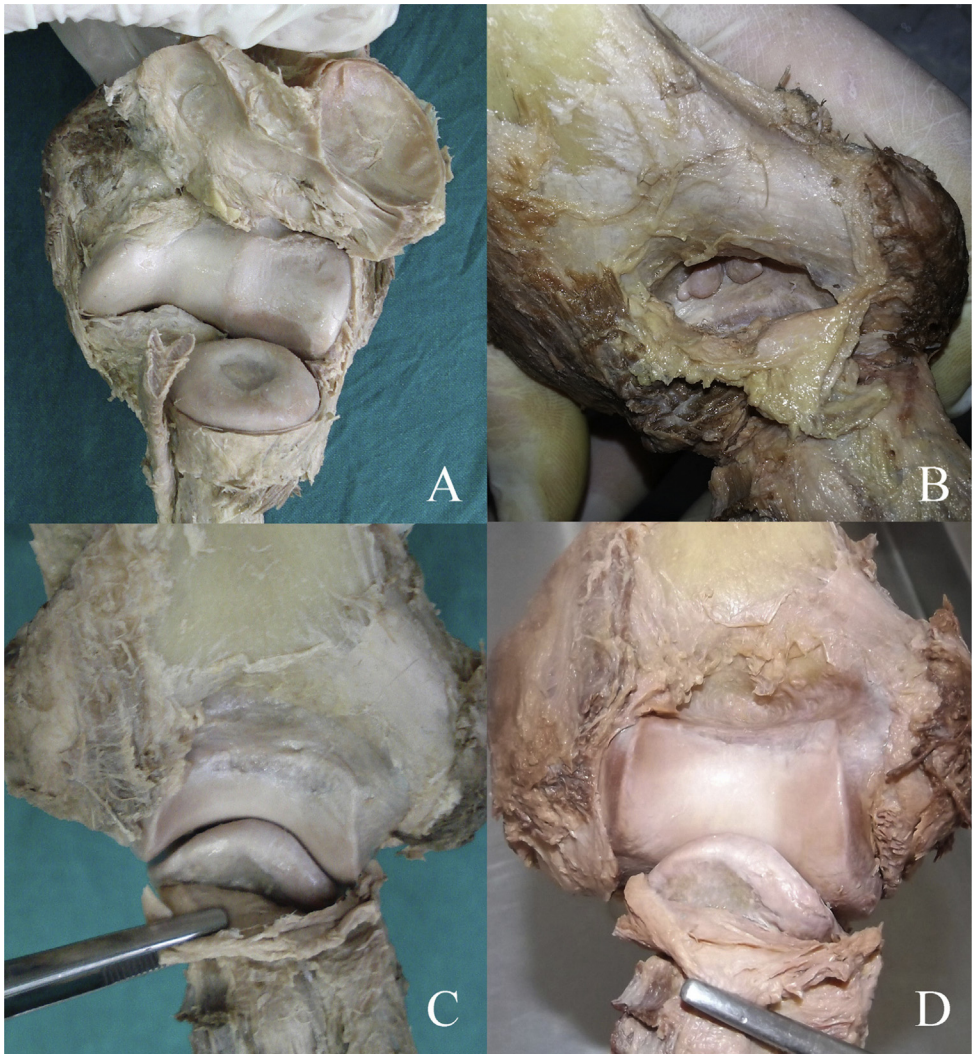

Fig. 1 – Elbow joint; A. Anterior aspect of the articular cavity; B. Posterior aspect. Fossa olecrani – three accessorious formations; C. Posterior aspect of the elbow joint in extension with a view of the cartilage; D. Posterior view in flexion showing the cartilage of trochlea and upper end of ulna.

attach to incisura trochlearis ulnae. Ligamentum collaterale radiale begins from the lateral epicondyl and divides into two bundles. The front bundle attaches to incisura radialis ulnae, and the back bundle weaves into ligamentum annulare radii. Ligamentum annulare radii wraps around the neck of the radius and attaches to incisura radialis ulnae. Ligamentum quadratum is located between incisura radialis ulnae and the neck of the radius. From a biomechanical point of view, the elbow joint provides movement in the transverse axis (140° flexion and 10° extension) and the vertical axis (internal and external rotation). Additional joint elements are two fat tissue pads located inside fossa coronoidea and fossa olecrani. The articular surfaces are covered with hyaline cartilage and the joint capsule is filled with synovial fluid. Disease can affect all of the joint elements – the bones, cartilage, synovial membrane, fibrous capsule, ligaments, etc. In this case study, we present a particular anomaly – the presence of intra-articular accessory cartilage fragments in fossa olecrani.

2. Materials and methods

The classical layered dissection method was used during the education of students at the Medical University of Plovdiv, Department of Anatomy, Histology and Embryology.

3. Results

Radius: Circumferentia articularis radii is very deformed with a diameter of 30 mm and a height of 19 mm. The covering articular cartilage is damaged with and erosion in fovea capitis radii with a diameter of 9 mm.

Humerus: Capitulum humeri is saddle-shaped, with a transverse diameter of 24 mm and a vertical diameter of 28 mm.

Trochlea humeri has a preserved form without pathological changes.

Fossa olecrani has preserved form and size and contains three accessorious formations laying freely on the surface of the fossa – flat, well confined, with a bone hardness (Fig. 1).

- Fragment 1 – rhombus-shaped with dimensions of 5/4 mm
- Fragment 2 – elliptical-shape with dimensions of 4/2 mm
- Fragment 3 – bisegmented with an irregular shape and dimensions of 6/4 mm

Olecranon: No pathological findings were found.

Capsula articularis: The joint capsule is thickened in the area of circumferentia articularis radii.

The three intra-articular cartilage fragments are atypical hyaline cartilage formations (Fig. 2). On the surface of the fragments there is a thin layer of perichondrium with stem cells. Near the surface, the cells are few, while in depth, the lacunae become larger and isogenic groups are visualized inside. There are locations with typical lacunae, but there are also numerous lacunae without chondrocytes. Besides the typical chondrocytes, no inflammatory cells were found – plasma cells, histiocytes and foreign-body cells. The connective tissue matrix is not homogeneous, but the destruction of the matrix could be due to the non-specific fixation. There are older lacunae without cells – a sign of growth. No signs of ossification are found.

4. Discussion

The findings were suggestive of the following differential diagnoses:

Gout – Damage to elbow joint is typical of gout.[1] This localization is characterized by an increased circulation and an elevated intra-articular temperature. Pathognomonic of gout is the presence of intra-articular gout tophi composed of uric acid.[2] In our case, there is no microscopic evidence of gout tophi.

Rheumatoid arthritis – Rheumatoid arthritis is characterized by subcutaneous rheumatoid nodules around the elbow joint. These rheumatoid nodules are composed of a fibrinoid necrosis, surrounded by epitheloid cells, lymphocytes and plasma cells. In the presented case, there are no changes in the subcutaneous tissue.[3]

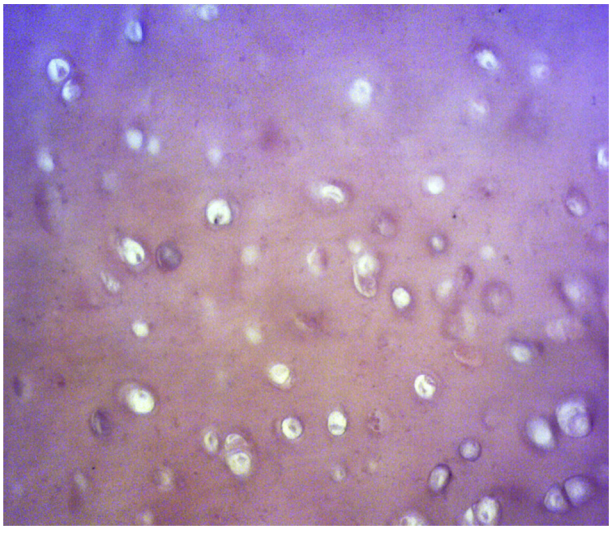

Fig. 2 – The cartilage fragments – atypical hyaline cartilage formations. H&E 40X magnification.

Postraumatic complication – After a bone trauma, a connective tissue callus is formed from the proliferation of granulation tissue which subsequently calcifies with the formation of bone rods. The presented intra-articular fragments show no signs of calcification.

Congenital anomaly – Congenital anomalies of the humerus and olecranon have been described. Such anomaly is the supratrochlear septum which divides the olecranon from fossa coronoidea. Genetic factors and environmental factors such as nutrition and working conditions which place pressure on the olecranon, could supposedly modify the supratrohlear septum thickness (Glanville, 1967).[4]

Ganglion cyst – The myxoid cyst is a soft tissue formation without a tumor genesis. It is often found around the joints and tendons of the hands.[5] This formation is an accumulation of mucus inside a thin capsule.[6]

Epicondylitis – Epicondylitis is also known as tennis elbow due to its increased incidence among tennis players. Studies show a link between back-hand swings in the sport and the disease. Epicondylitis is a reversible inflammation of the tendons of the extensor muscle group in the forearm, which attach to epicondylus lateralis.[7] This condition is associated with a rupture of extensor carpi radialis brevis, tenderness and limitation of movement. Irreversible secondary changes in the tendon of this muscle – fibrosis and calcification are also found.[8]

The only literature data comparable to our case is that of the Norwegian scientist Dr. Gudmundsen. He describes five clinical cases with bone fragments in fossa olecrani, fossa coronoidea and on the medial and lateral epicondyl, which he calls "Os supratrochleare anterius and posterius."[9] Our histological studies, however, prove with certainty that the presented fragments are composed of atypical hyaline cartilage without any signs of ossification.

5. Conclusion

Our case report presents an anatomical variation which is best described by the term cartilago supratrochlearis dorsalis.

Conflicts of interest

All authors have none to declare.

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