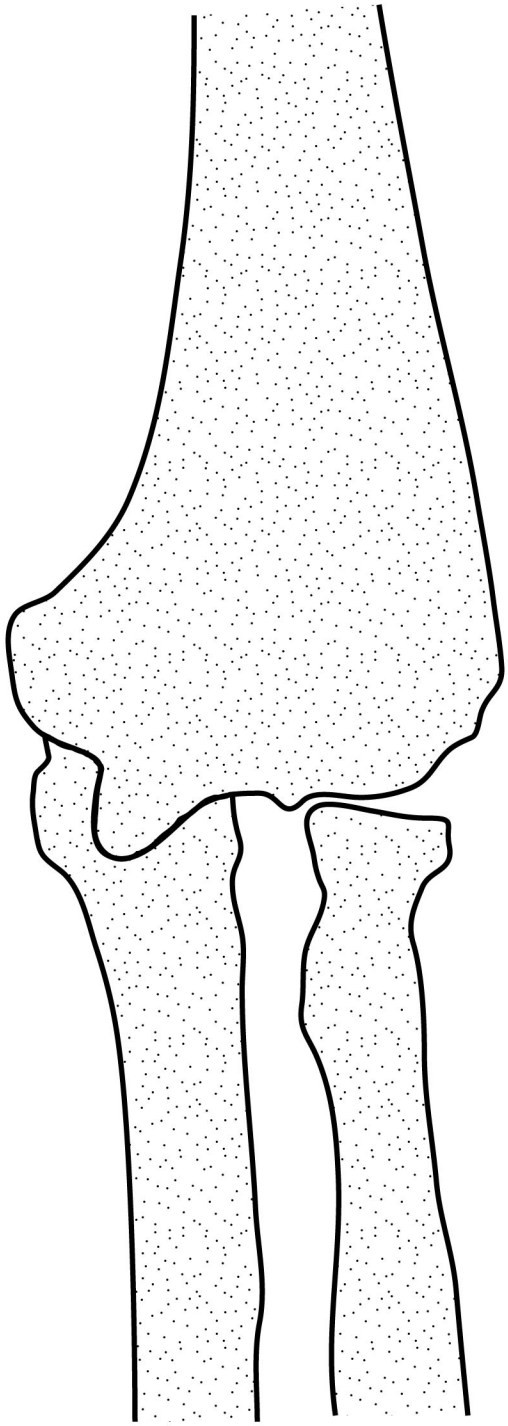
Peristence & Creativity

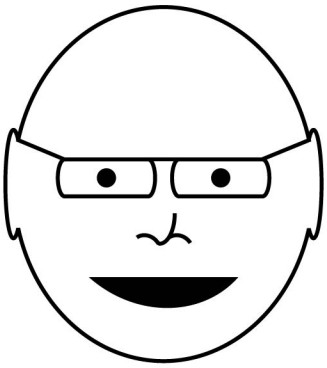
Anatomy Comics, Objective 6.1

Simple Comix

6.1 Identify the major processes of the distal humerus, the proximal ulna and radius. Identify the joints formed by these bones and the ligaments that support them. Identify the biceps, brachialis, and triceps muscles that produce movements about these joints along with the action and innervation of each.

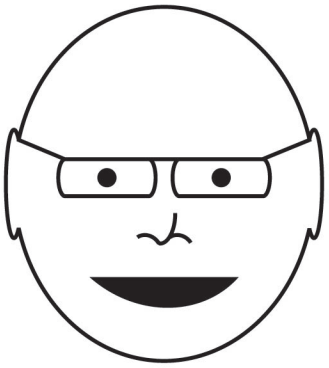


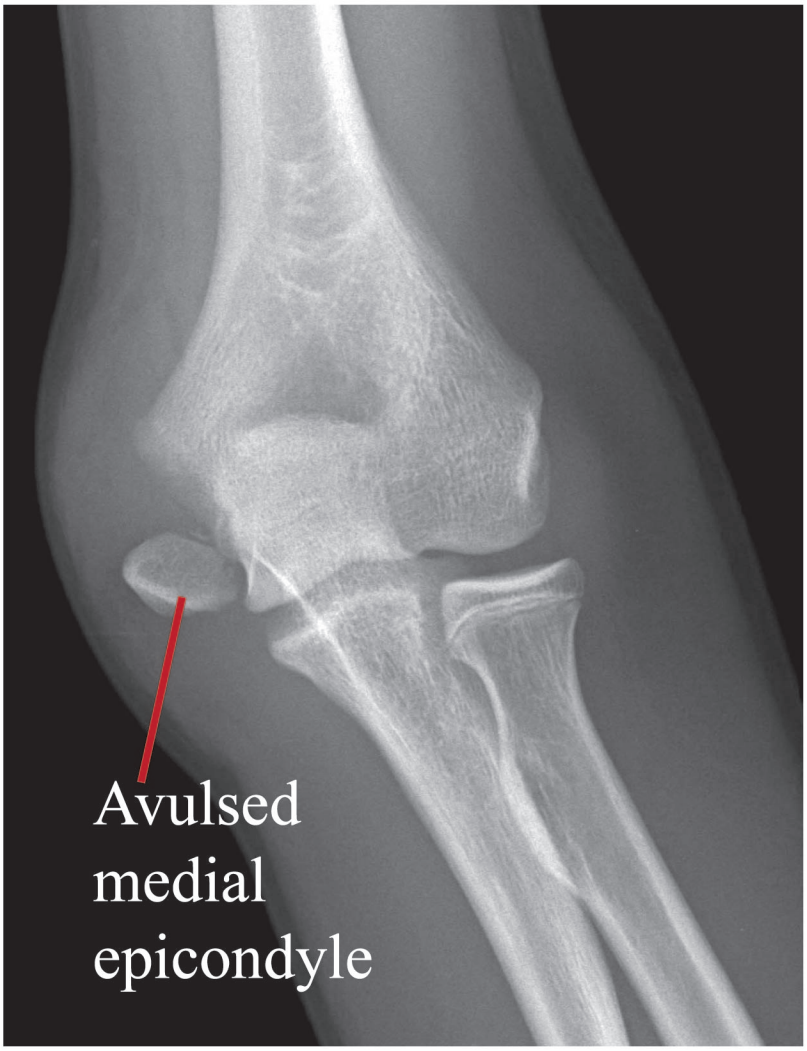
1. A 13 year old old presents with acute elbow pain after a fall on an outstretched hand (FOOSH). His elbow x-ray is shown at left below, with a normal comparison at right. What is abnormal?



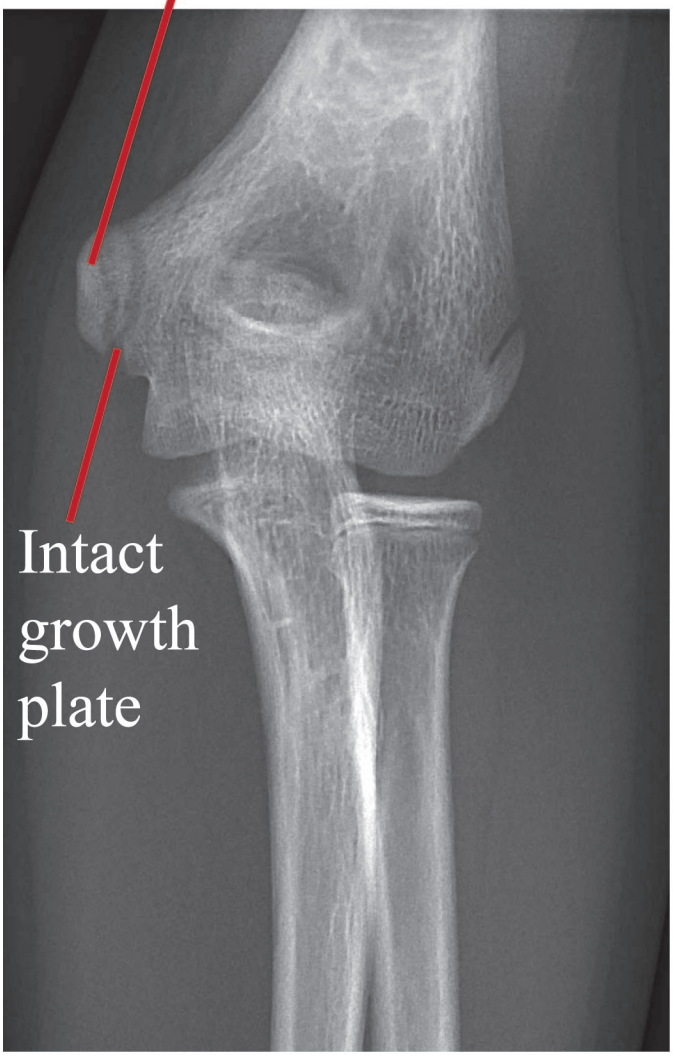
A. Avulsion lateral epicondyle
B. Avulsion medial epicondyle
C. Fracture lateral epicondyle
D. Fracture medial epicondyle

The answer is B, the medial epicondyle is avulsed ie, torn from its normal attachment to the distal humerus. Compare the normal and abnormal elbows. Keep in mind that since this is a child, not all of the humerus is completely ossified, some parts of the humerus still have cartilaginous growth plates. Because these plates are weaker than bone, they can fail, resulting in avulsion injuries.





Intact medial epicondyle

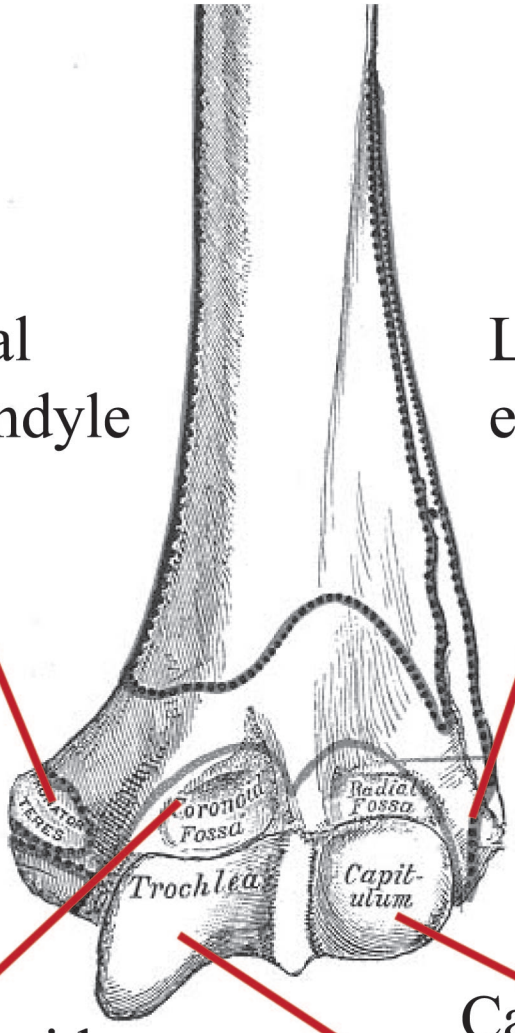


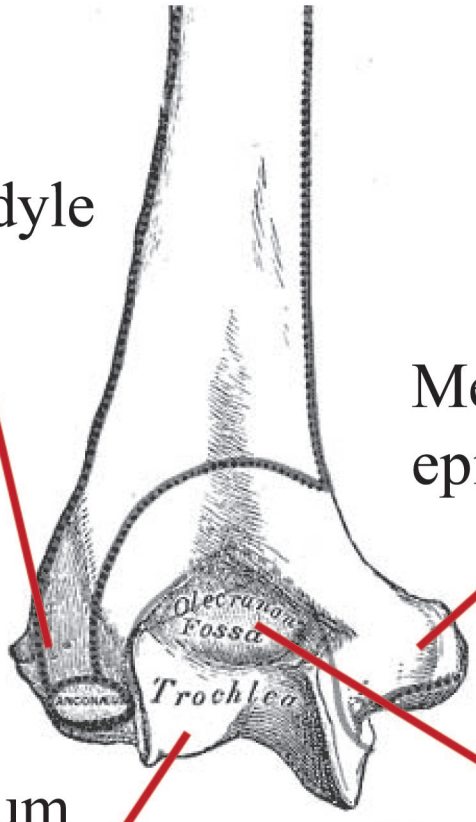
Yup, bone is strong!

Let's learn about all of those bony knobs and bumps around the elbow, starting with the distal humerus. I have labelled many of those bumps and 2 depressions on these drawings of the anterior and posterior humerus from Gray's Anatomy. You can feel some of these bumps on yourself. For example, the medial epicondyle should be easily palpable along the medial aspect of the elbow. The smaller lateral epicondyle is more difficult to feel. The capitellum articulates with the radial head, the trochlea with the trochlear notch. We'll see the radial head and the trochlear notch next.

Anterior view

Posterior view





Medial epicondyle

Lateral epicondyle

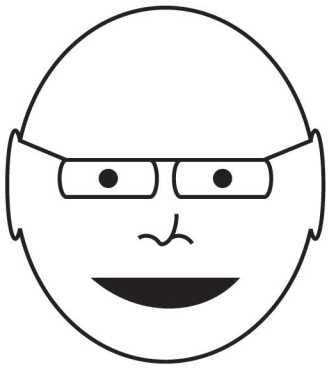
Medial epicondyle

Coronoid fossa

Capitellum

Trochlea

Olecranon fossa



Next, we'll look at the proximal radius and the ulna from the front and back. We'll label some more of those bumps. These knobs and bumps are tendon/ligament attachment sites or form the articulations of the elbow joint. Some are also important landmarks that help us to recognize other vital structures. We'll have a look at some of this anatomy using the visible human project.

Anterior view

Posterior view

Trochlear notch

Olecranon process

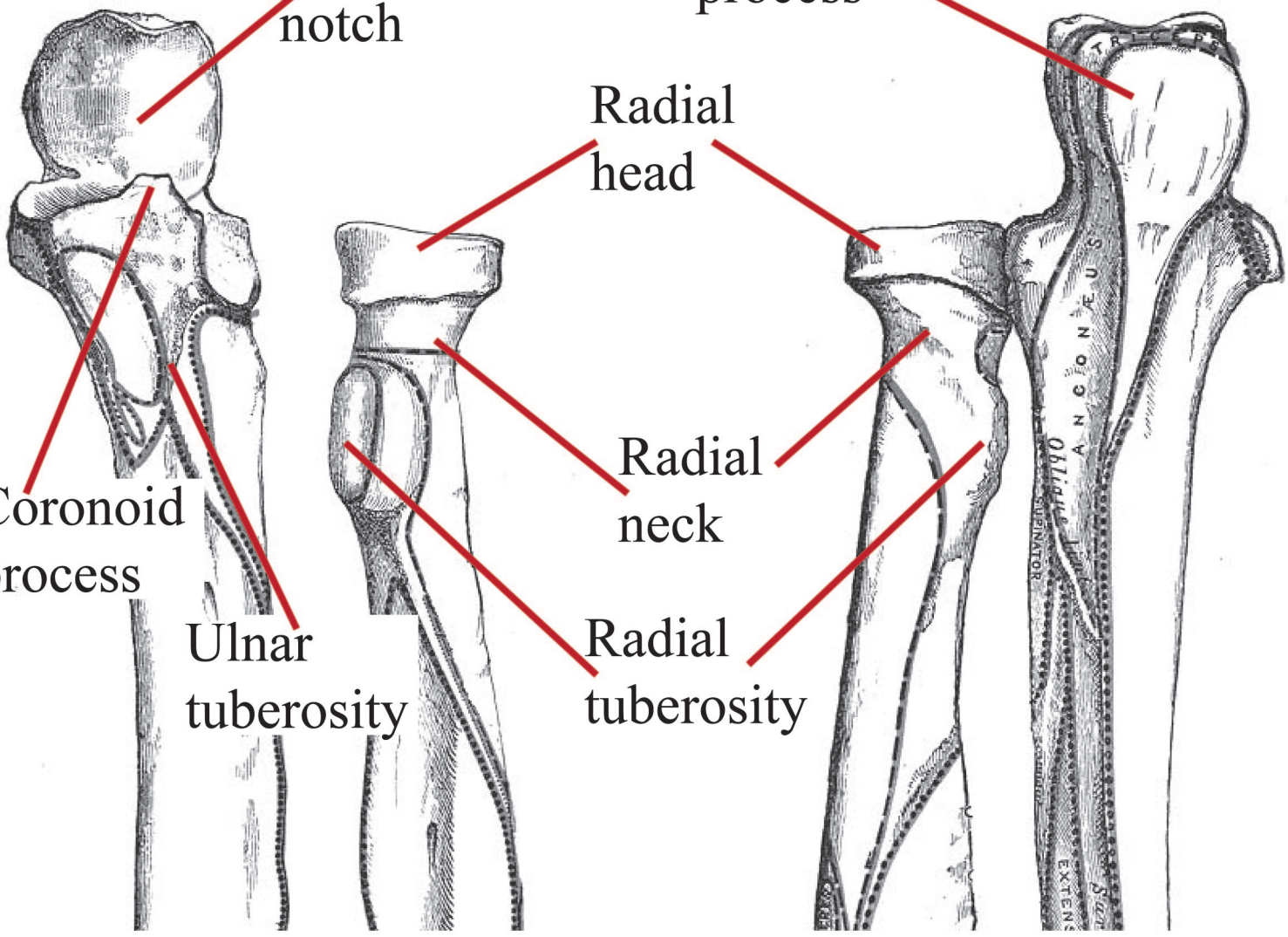
Radial head

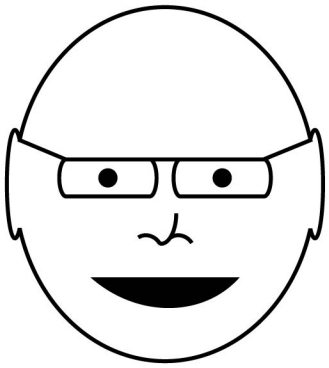
Coronoid process

Radial neck

Ulnar tuberosity

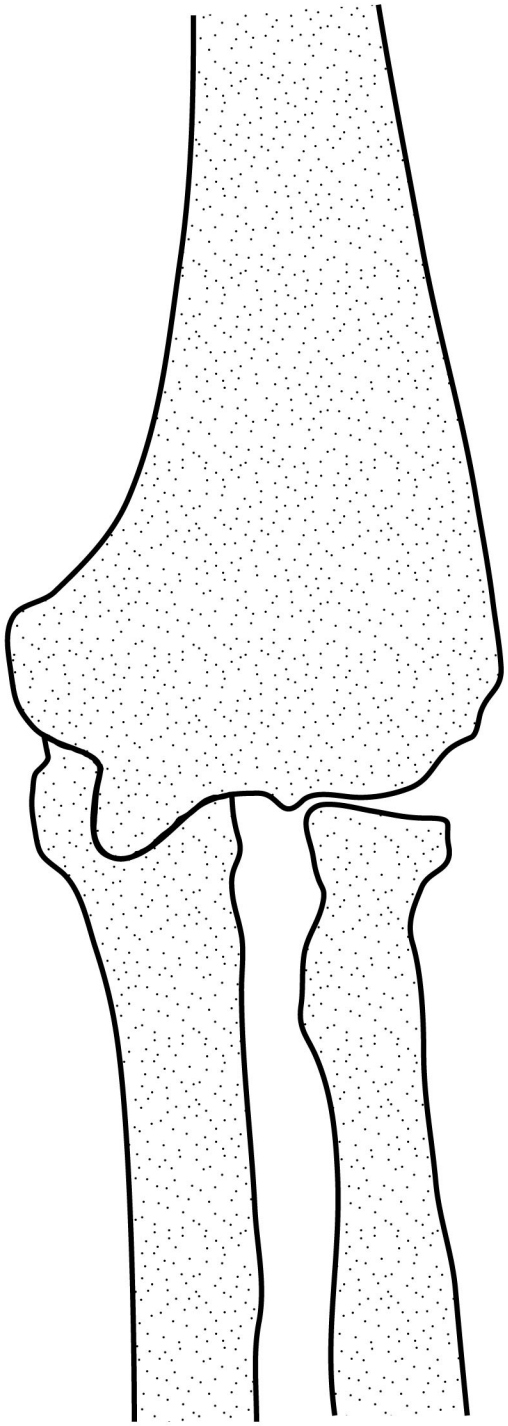
Radial tuberosity



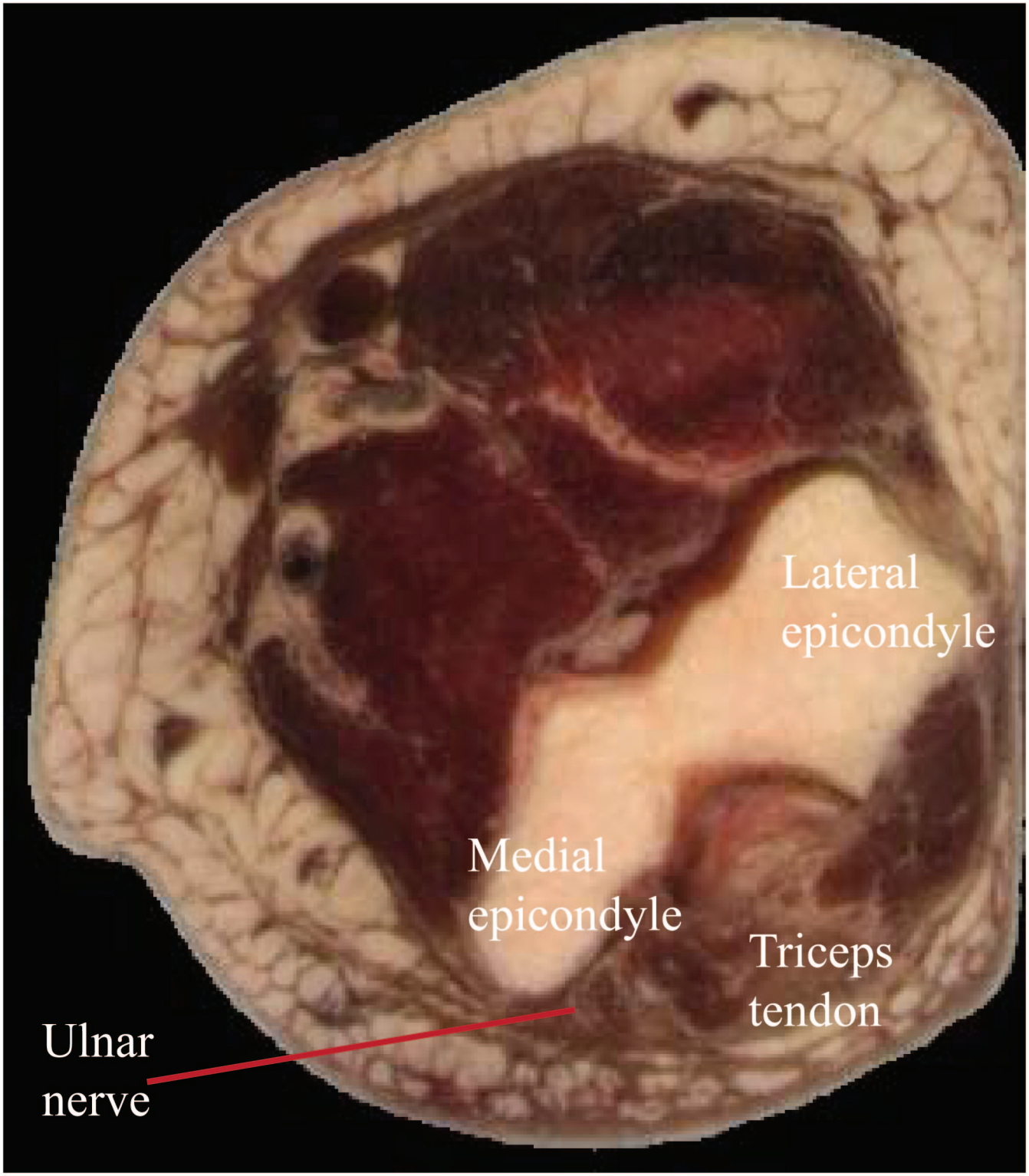


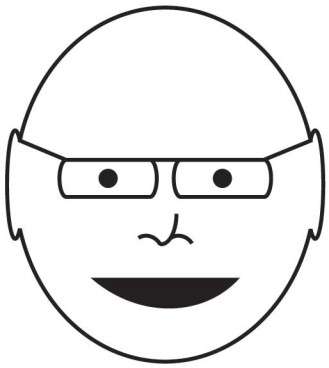
This is a drawing of the elbow joint from the front. See if you can draw it and name all of the structures that we just looked at.

If you can't draw it, try tracing it.

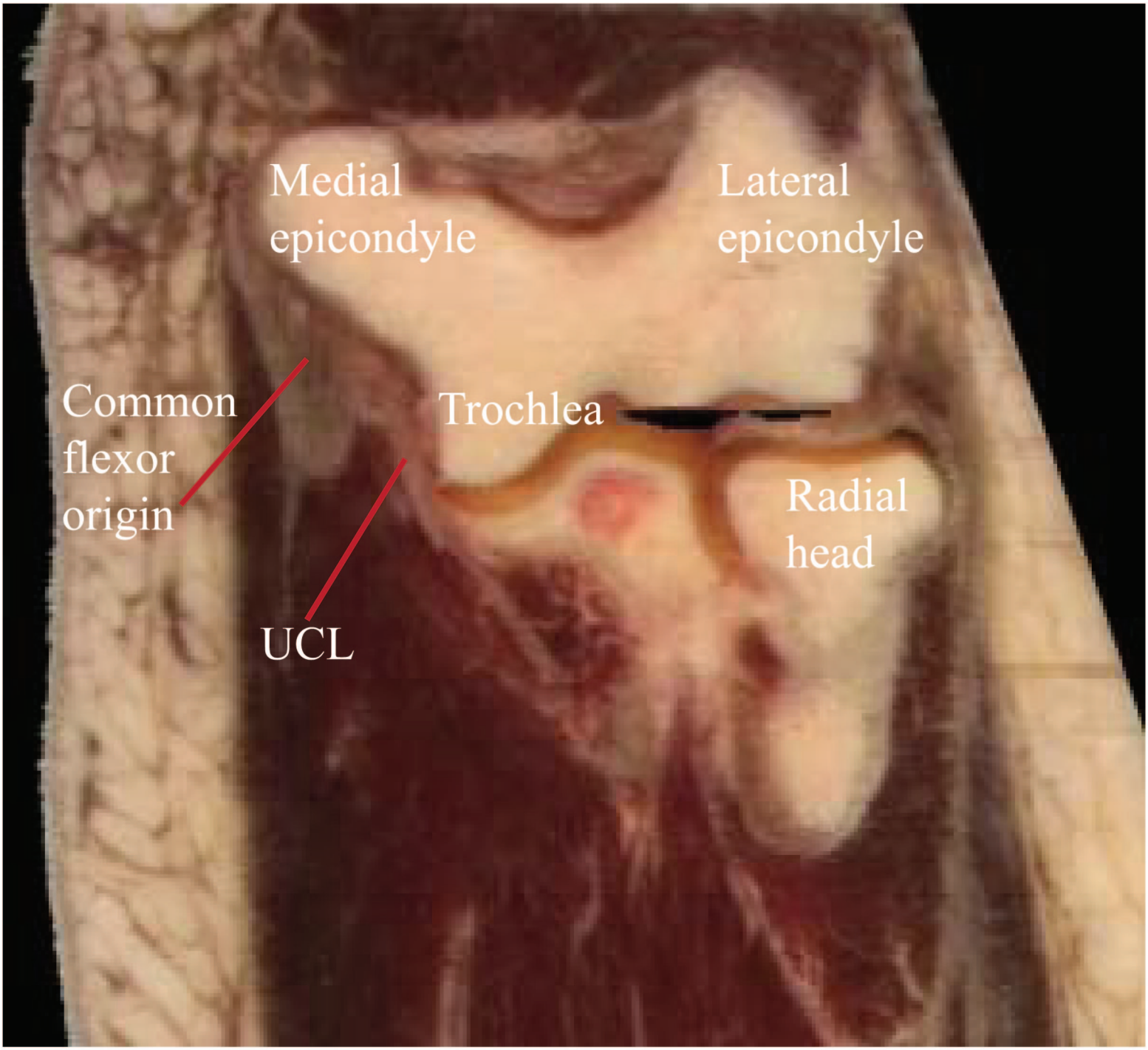


So let's look at some of these structures using images from the visible human, starting with the medial epicondyle. We'll look at 3 things: the postion of the ulnar nerve, the common flexor origin and the ulnar collateral ligament. You should be able to orient yourself on this axial image using the clues provided. Hint: where is the triceps tendon, anterior or posterior?



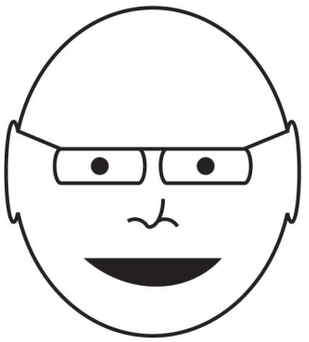


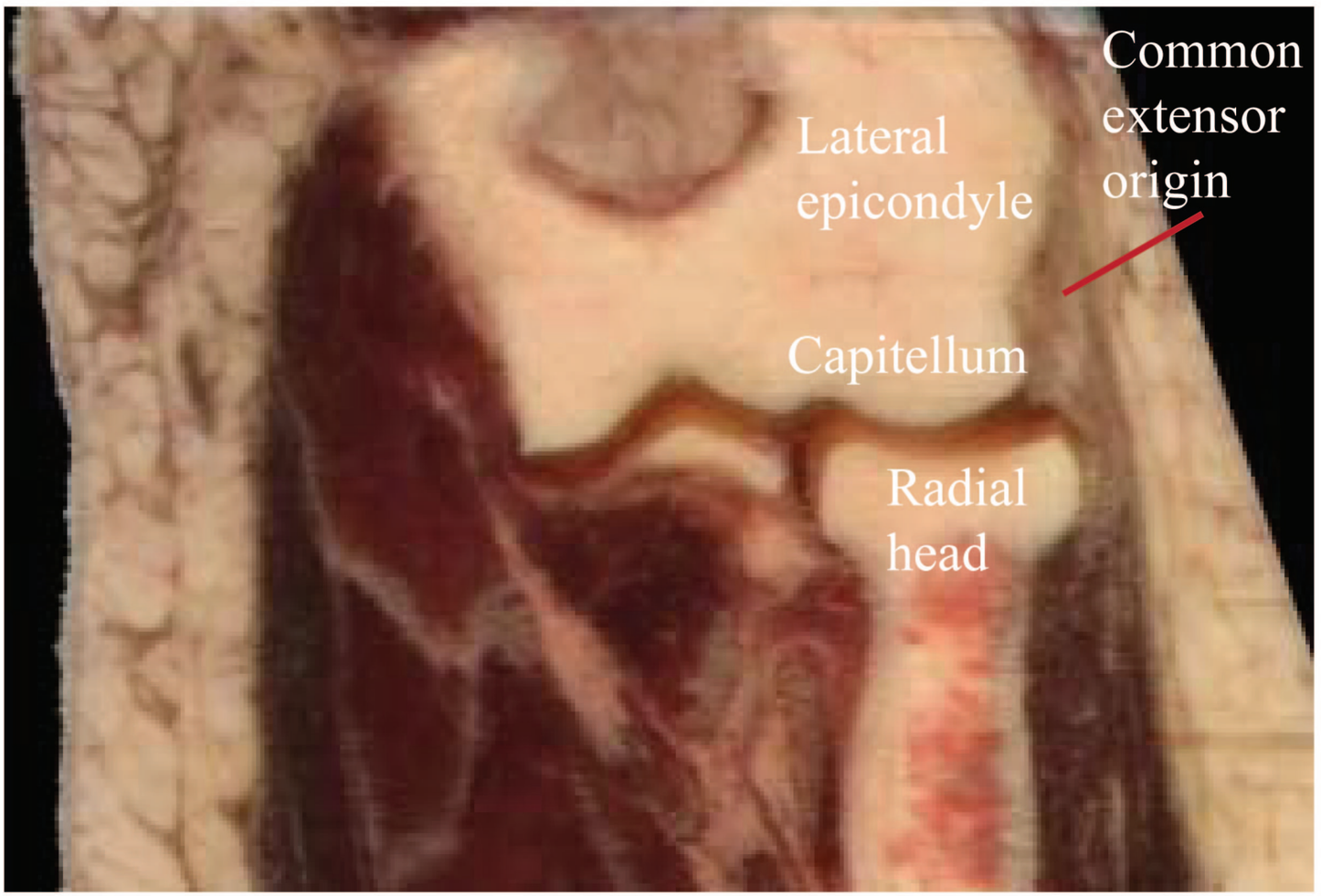
In the coronal plane, we can recognize the common flexor origin and the ulnar collateral ligament (UCL) arising from the medial epicondyle.

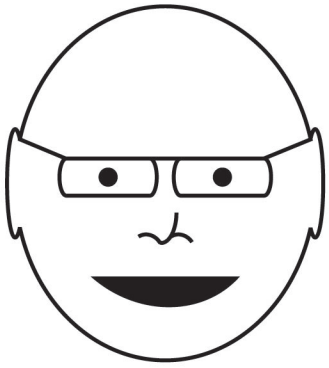


Conveniently, the lateral epicondyle is the attachment site for the common extensor tendon, shown on this coronal image.

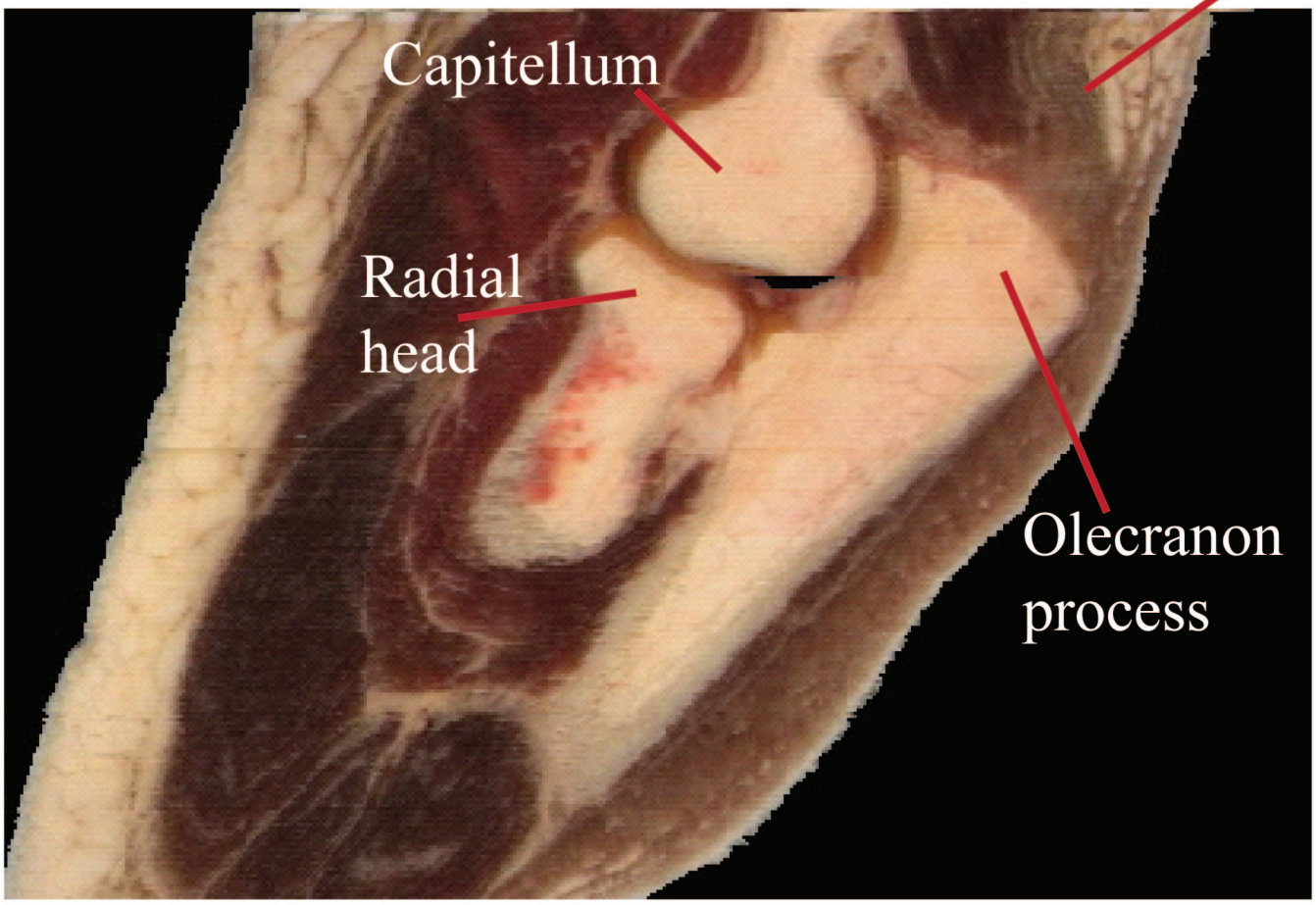
Yep.

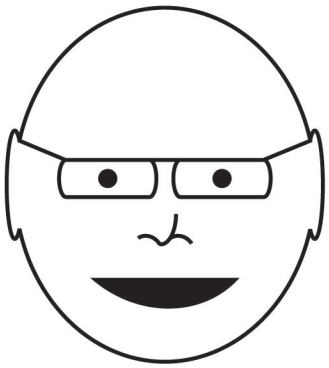




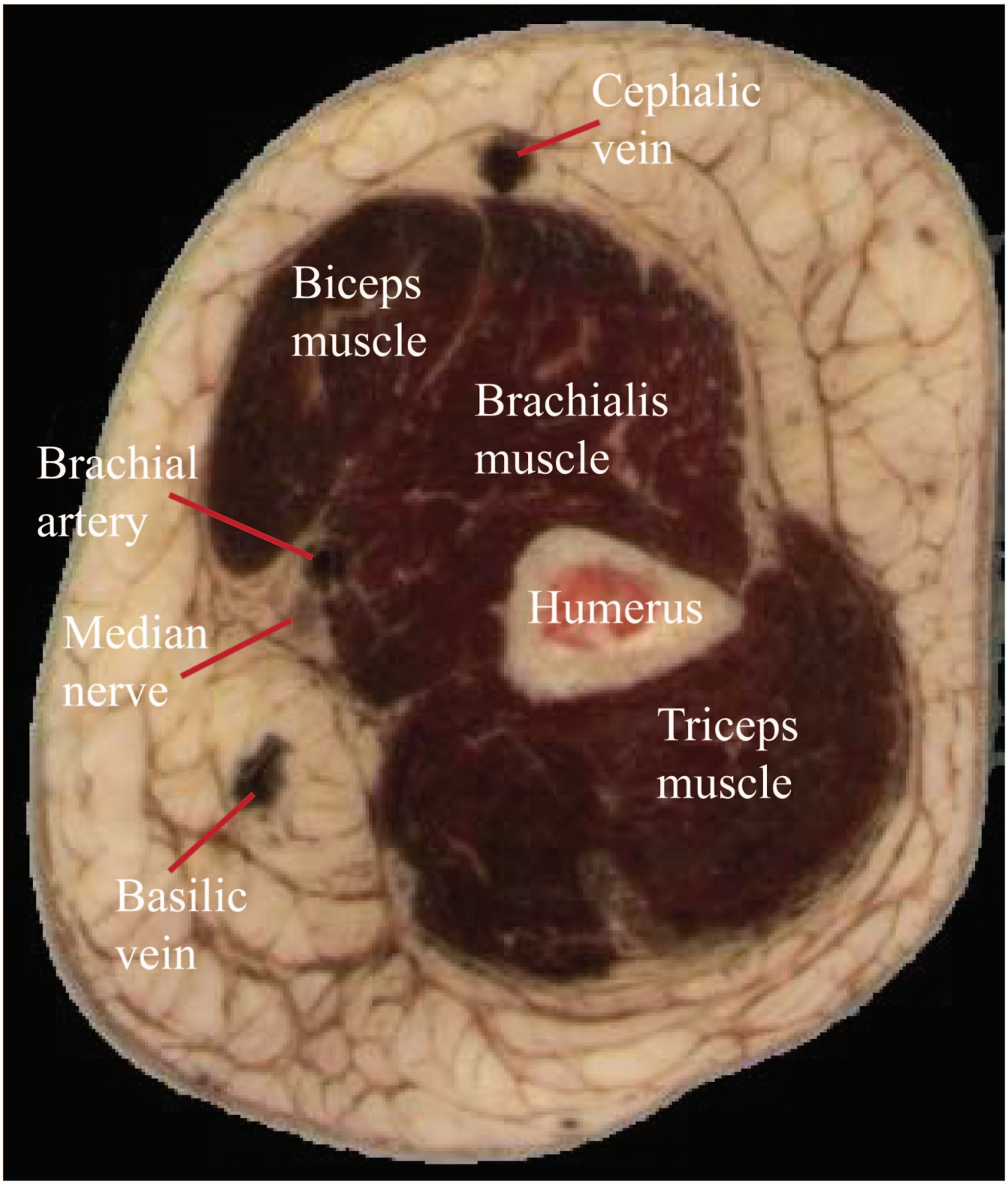


Here is a sagittal image showing the insertion of the triceps tendon onto the olecranon process.

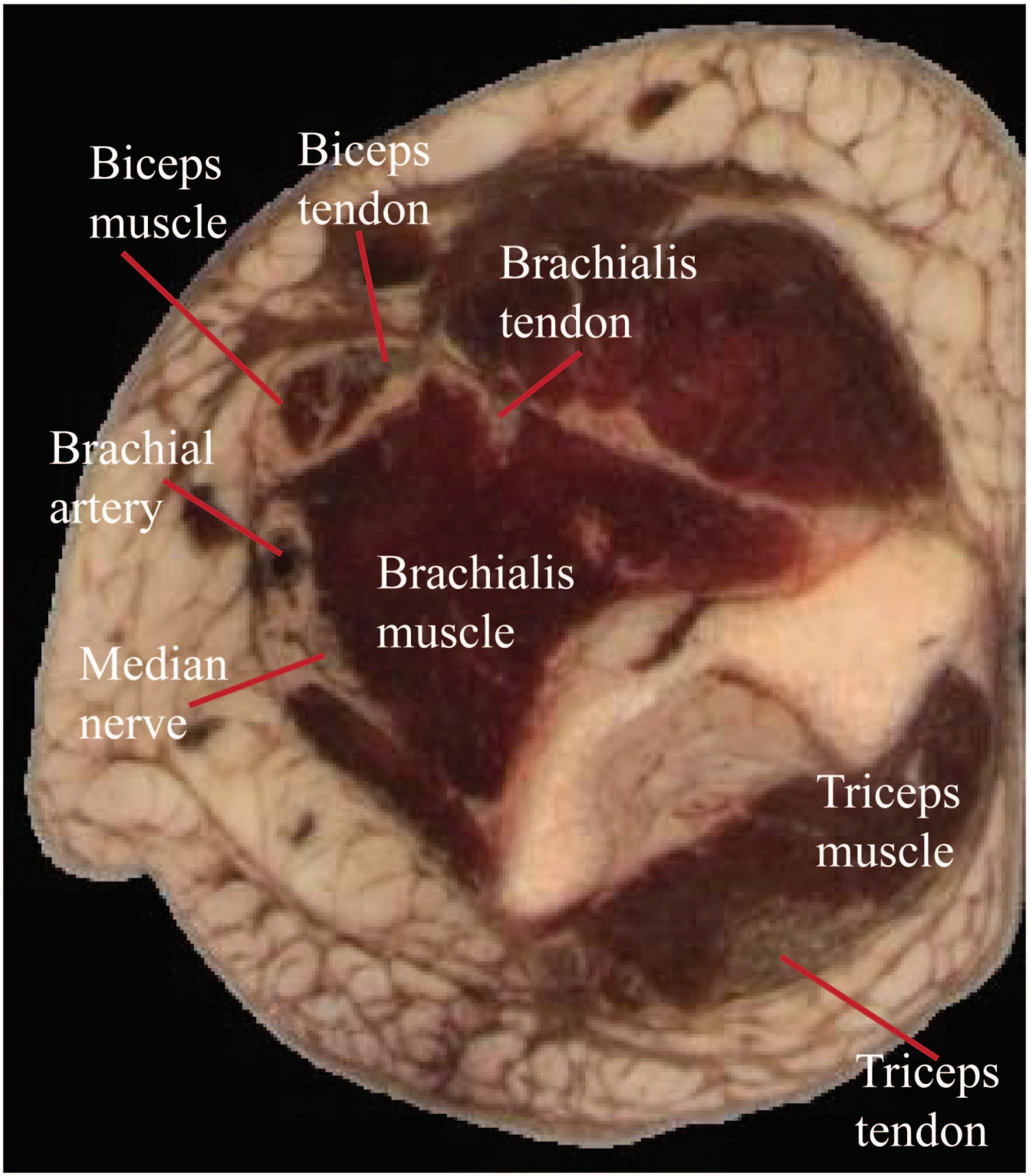


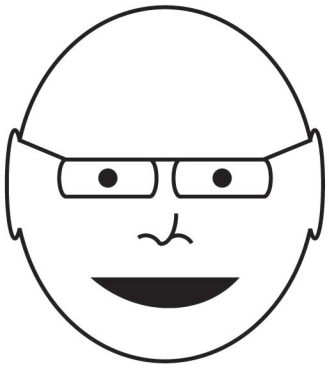


Last, we will look at the insertion of several muscles onto the radius and ulna, and we will have a look at the distal brachial artery and its bifurcation into the radial and ulnar arteries. We'll start in the distal arm. If you remember that the triceps is posterior and the Basilic vein is medial, you should be able to orient yourself.

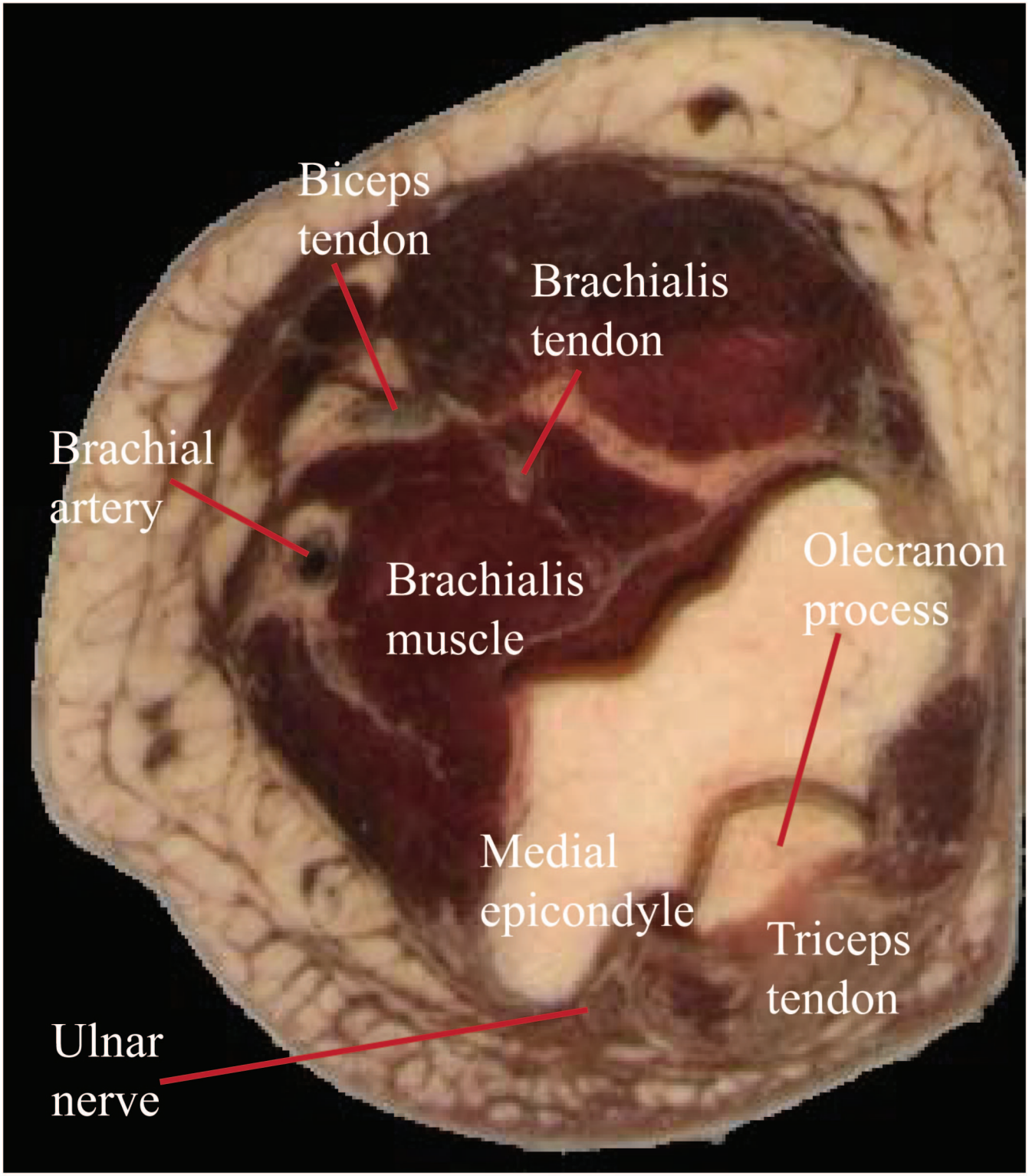


This image was obtained just below the previous one, we are getting into the epicondyles. The biceps, brachialis and triceps tendons are becoming visible within the muscles. We will follow the tendons to their insertions.

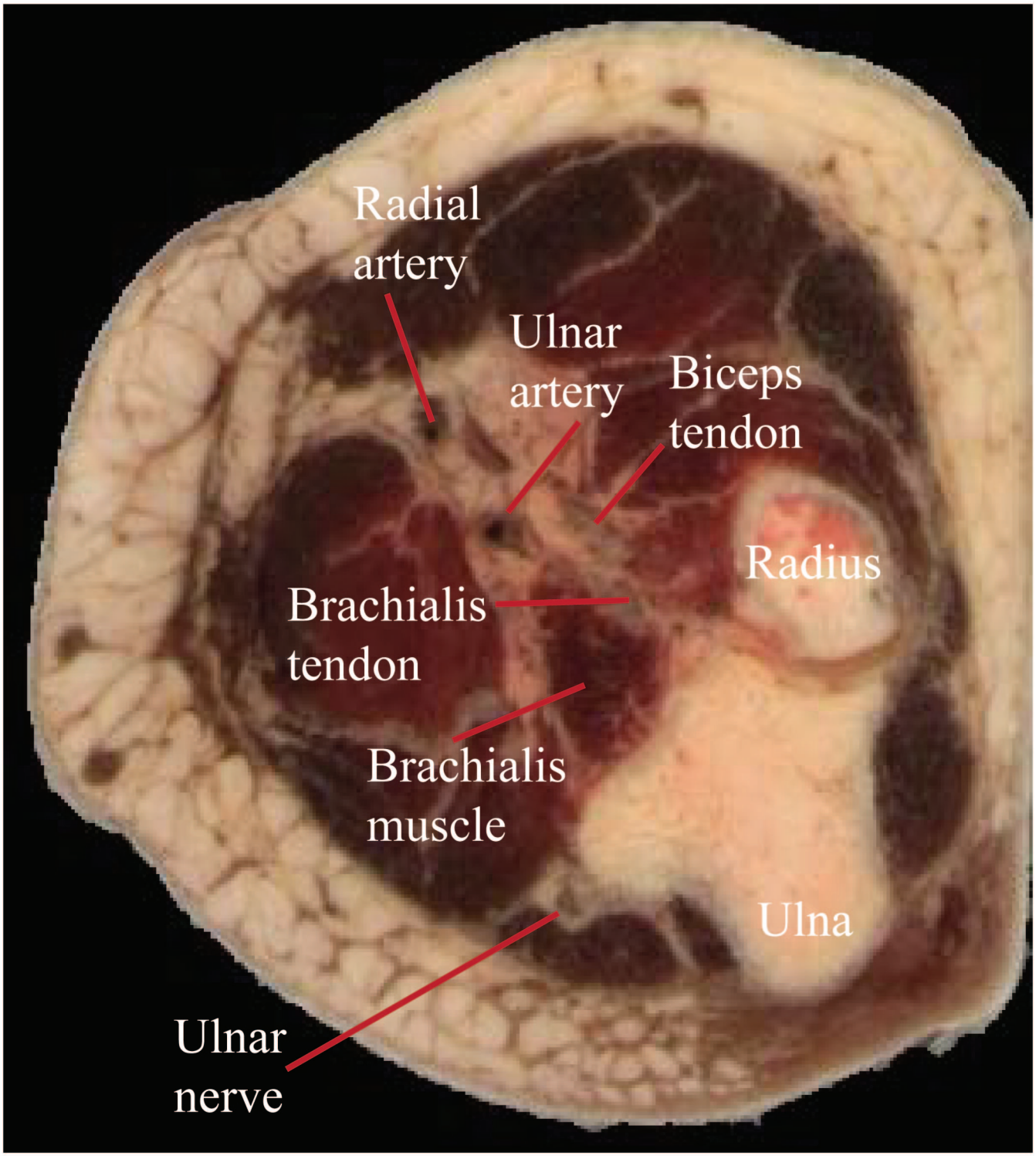


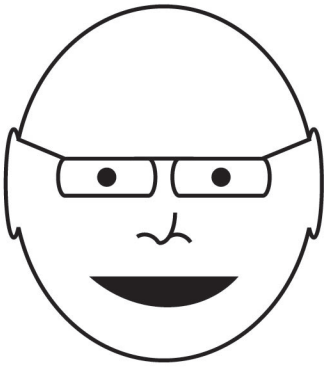


Moving still more caudal, we have reached the insertion of the triceps tendon on the olecranon. We have lost the biceps muscle completely and are left with the biceps tendon.



We've reached the level of the radius and ulna; the brachial artery has divided into the ulnar and radial arteries. The biceps tendon is heading for the radial tuberosity while the brachialis tendon is headed for the ulnar tuberosity.





At last, we have reached the ulnar and radial tuberosities where the brachialis and biceps muscles insert. Phew!

Be sure to join us for the next thrilling "Anatomy Comics"!