

THE ARRANGEMENT OF THE BURSÆ IN THE SUPERIOR
EXTREMITIES OF THE FULL-TIME FŒTUS. By CHARLES
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In a recent paper published in this Journal (1) the author described the synovial membrane in the palmar digital sheaths at birth. This communication records the bursæ found in the superior extremities of the full-time foetus.

For the purpose of the research the upper limbs of twenty subjects were examined. As the ordinary dissectional methods do not always prove satisfactory in the investigation of the more minute bursæ, the writer, in doubtful cases, supplements these methods by silver nitrate injections. In the latter, a small cone of the wall of the bursa is seized with fine forceps, pricked with a needle, and any synovial fluid present allowed to escape. When the sac is empty a small quantity of silver nitrate solution is injected by means of a hypodermic syringe. (The solubility of silver nitrate is approximately two parts to one of distilled water.) Any excess of solution is easily removed by gentle pressure with a piece of absorbent paper. On slitting up the exposed wall the silver nitrate is quickly darkened, and the extent of the sac can be determined accurately.

In the region of the Carpus and Hand.

(a) *Beneath the insertion of the m. extensor ossis metacarpi pollicis.*—Dujarier (2) in plate 20 of his work figures a serous bursa between the tendon of this muscle and the base of the first metacarpal bone. He does not, however, mention the fact in his description of the muscle. Poirier (3) states that a bursa is present between the tendon and the trapezium.

In seven specimens a distinct sac was found separating the tendon from the base of the metacarpal bone. It did not extend over the trapezium, and had no communication with the synovial sheath of the tendon.

(b) *The bursæ connected with the radial extensors.*—It is usually stated in text-books, that in adults a bursa separates each radial extensor from the metacarpal bone into which it is inserted. In the writer's experience the bursa of the extensor carpi radialis brevior is quite constant, but that of the extensor carpi radialis longior is subject to great variation, being

generally much smaller than the former, and often absent. The stability of the breviar bursa is probably due to the fact that, in the movements occurring at the radiocarpal articulation about its antero-posterior axis, the ulnar border of the breviar tendon glides against the tubercle on the base of the third metacarpal, and also against a tubercular projection frequently present on the dorsal surface of the os magnum.

In the fœtus the bursa of the extensor carpi radialis breviar can always be readily distinguished: it covers the radial aspect of the dorsal surface of the third metacarpal and the contiguous area of the os magnum. The bursa of the extensor carpi radialis longior was absent in five specimens. When present, it intervened between the radial aspect of the dorsal surface of the base of the second metacarpal and the adjacent portions of the trapezoid and trapezo-trapezoid joint. Neither bursa communicated with the synovial sheaths of the tendons.

According to Bardeen (4), a bursa exists between the tendons of the long and short radial extensors and the tendons of the extensor ossis metacarpi pollicis and the extensor brevis pollicis. No bursa could be discerned in the fœtus between these two groups of tendons.

(c) *Bursæ of the palmar interossei*.—A series of bursæ are interposed between the tendons of the palmar interossei and the deep transverse and lateral ligaments of the metacarpo-phalangeal joints (5). These are identical with the b. metacarpo-phalangeal of Bardeen. They are absent at birth.

(d) *Bursa of m. flexor carpi ulnaris*.—A minute sac found between the flexor carpi ulnaris tendon and the pisiform bone. This was present in five cases.

(e) *Bursa of m. flexor carpi radialis*.—A bursa, independent of the synovial sheath, lies between the tendon of the flexor carpi radialis and the palmar surfaces of the bases of the second and third metacarpals. No separate bursa was found at birth.

In the region of the Elbow.

(a) *Bursa bicipito-radialis*.—This bursa is well developed at birth and does not present any unusual feature. In adults a second bursa may be occasionally seen separating the biceps tendon from the oblique ligament of the radius. It was not observed in the fœtus.

(b) *Beneath anconeus muscle*.—A small bursa is frequently present between the anconeus muscle and the head of the radius. In the fœtus this bursa was demonstrated in three specimens.

(c) *Olecranon bursa*.—Two bursæ are described in connection with the

olecranon process of the ulna, namely, the subcutaneous—a large unilocular sac covering the posterior surface of the olecranon, and the subtendinous—separating the triceps muscle from the summit of the olecranon and the dorsal ligament of the elbow-joint. The former is constant, but the latter is sometimes absent.

The subcutaneous bursa was distinctly recognised in eight cases only; in the remaining fœtuses the subcutaneous area of the olecranon was covered with a loose meshwork of connective tissue, which readily cleaved in any plane. With one exception the subtendinous bursa was found in every specimen.

In the region of the Shoulder.

(a) *Subcutaneous acromial bursa.*—Mentioned by Bourgerie (6) and later writers. It was absent in all the fœtuses examined.

(b) *Sub-acromial bursa.*—This sac is constantly present at birth, and in two specimens was multilocular in character. It has well-defined boundaries, being limited above by the acromion process of the scapula with the attached portion of the deltoid muscle, and also by the coraco-acromial ligament; below are the insertion of the supraspinatus muscle and the capsular ligament.

(c) *Sub-deltoid bursa.*—In adults this bursa is interposed between the deltoid muscle and the great tuberosity of the humerus. It is often fused with the sub-acromial.

A separate sub-deltoid bursa was found in only one fœtus.

(d) *Coraco-clavicular bursa.*—A small bursa is frequently placed between the conoid and trapezoid elements of the coraco-clavicular ligament. Usually a few fibres of the subclavius muscle are attached to the bursal wall.

With two exceptions it was possible to demonstrate its existence at birth.

(e) *Supraspinatus bursa.*—In four fœtuses a bursa was discovered between the upper border of the supraspinatus muscle and the coraco-humeral ligament.

(f) *Infraspinatus bursa.*—A bursa is sometimes found between the infraspinatus muscle and the capsular ligament; it rarely communicates with the shoulder-joint.

This bursa was absent in every case examined.

(g) *Subscapular bursa.*—The subscapular bursa develops in the last month of fœtal life and very early communicates with the joint (7).

Both the bursa and its aperture were readily recognised in the fœtus.

(h) *Subcoracoid bursa.*—Occasionally in adults a small bursa forms between the upper border of the subscapularis muscle and the root of the

coracoid process. It may be looked upon as a detached portion of the subscapular bursa.

Absent in all specimens.

(i) *Beneath coraco-brachialis muscle*.—A bursa intervenes between the conjoined heads of the coraco-brachialis and biceps and the subscapularis tendon.

No trace of this bursa was found at birth.

(j) *Intertubercular bursa*.—The name intertubercular is applied to the diverticulum from the shoulder-joint along the bicipital groove. It is constantly present at birth and averages 1.5 cm. in length. The biceps tendon at this stage possesses a well-marked meso-tendon.

(k) *Bursa of the pectoralis major*.—A bursa is sometimes found between the insertion of the pectoralis major tendon and the long head of the biceps.

It was present in two specimens.

(l) *Bursa of the latissimus dorsi*.—Two bursæ occur in relation to the tendon of the latissimus dorsi (8), one anterior to the tendon, and one between this tendon and the tendon of the teres major.

The former was absent and the latter present in all cases.

(m) *Bursæ of the teres major*.—Three bursæ are mentioned as occurring at the insertion of the teres major muscle, separating the tendon from the latissimus dorsi, the humerus, and the long head of the triceps respectively.

The first of these has been already referred to; the second was found in nine fœtuses; the third was absent in every case.

(n) *Costo-clavicular bursa*.—A bursa is occasionally present in the interior of the costo-clavicular ligament (9).

It was impossible to demonstrate one at birth.

(o) *Sub-trapezial bursa*.—This bursa, situated between the trapezius muscle and the scapular spine, was well developed in every fœtus.

REFERENCES.

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- (6) BOURGERY, *L'Anatomie de l'Homme*.
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- (8) GRAY, *Text-book*.
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