Bilateral Musculus Infraclavicularis

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Abstract
We describe a rare accessory pectoral muscle that was found during surgery on both sides in a 78-year old female patient treated with reverse total shoulder prostheses. The muscle has its origin at the middle third of the clavicle, is separated from the clavicular part of the pectoralis major, crosses the cephalic vein and inserts on the fascia of the deltoid muscle. The muscle is triangular in shape with the apex at the origin and the base at the insertion.

Keywords: Pectoral; Muscle; Human; Anatomy; Accessory; Supernumerary

Introduction

Figure 1: Drawing of the left pectoral region of an adult human subject with a musculus infracavicularis. Columbia University Museum, No 2514 (copied from Huntington, G. (1904).
Anatomists have described several supernumerary muscles around the shoulder. They have been classified by Huntington [1] according to their topographic position into: A) deep supernumerary muscles, situated in the space between the pectoralis major and minor, and B) superficial supernumerary muscles, placed superficially to the pectoralis major. One of them is the musculus infraclavicularis, first described by Testut in 1884 and since then mentioned only a few times in the international literature (1,2) (Figure 1). The last report dates from (3). Accordingly, only drawings have been published. We present a photograph of a musculus infraclavicularis, which was observed during surgery in a Caucasian female.

Case Report

A 78-year-old female with the diagnosis of a massive non-reparable rotator cuff tear and associated glenohumeral arthritis on both sides was treated with reverse total shoulder prostheses. The shoulders were operated on at an interval of 7 months using the same standard surgical procedure. During dissection of the delto-pectoral interval a thin, fan shaped superficial muscle crossing the operative field from medial to lateral was discovered. It originated from the anterior-inferior aspect of the middle third of the clavicle, superficially to the clavicular part of the pectoralis major, crossed the cephalic vein and inserted into the fascia of the deltoid muscle (Figure 2). The whole muscle consisted of fleshy fibres and had no macroscopically visible tendinous portion. The length of the muscle measured approximately 9cm; the width increased from 1cm at the origin to 3cm at the insertion and the thickness was constant and approximately 2mm. The neurovascular pedicle could not be identified. As described by Huntington, the proximal part of the delto-pectoral interval was wider than usual. On the right side the accessory muscle was carefully detached from its insertion on the deltoid and sutured to the pectoralis major in order to facilitate access to the shoulder. On the left side it was retracted superiorly with use of a retractor, and it was still intact at the end of the procedure. No other family member of the patient had a shoulder surgery; it is therefore not known, if the above-described muscle exists in other persons related to the patient. At the latest follow-up the patient was pain free and had a good shoulder function on both sides.

Discussion

Different accessory muscles around the shoulder girdle have been described: the pectoralis quartus muscle (1,4,5], the sternoclavicularis muscle (1,6), the axillary arch (7,8), the sternalis muscle (9), the chondroepitrochlearis muscle (10,11) and the infrACLavicularis muscle (12) (Table I). The infrACLavicularis muscle described by Testut has its broad origin at the anterior boarder of the clavicle and inserts in the...
aponeurosis of the pectoral and deltoid muscle. The muscle presented in this paper is slightly different from the musculus infradavicularis initially described, because it has only a small insertion and no tendinous extension.

Table 1: Listing of the supernumerary muscles of the pectoral region published in the international literature.

<table>
<thead>
<tr>
<th>Muscle</th>
<th>Author</th>
<th>Origin</th>
<th>Insertion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chondro coracoideus ventralis</td>
<td>Gruber</td>
<td>first rib and cartilage</td>
<td>coracoid process and subdeltoid aponeurosis</td>
</tr>
<tr>
<td>Pectoralis tertius</td>
<td>Macalister</td>
<td>upper ribs</td>
<td>coracoid process and crest of tuberculum majus</td>
</tr>
<tr>
<td>Pectoralis quartus</td>
<td>Macalister</td>
<td>lower ribs</td>
<td>proximal humerus</td>
</tr>
<tr>
<td>Prae-clavicularis</td>
<td>Gruber</td>
<td>sternoclavicular joint capsule, mid third anterior clavicle</td>
<td>acromion</td>
</tr>
<tr>
<td>Tensor semi-vaginae</td>
<td>Gruber</td>
<td>first and/or second costal cartilage and sternum</td>
<td>deep fascia of the deltoid</td>
</tr>
<tr>
<td>Pectoralis tertius</td>
<td>Macalister</td>
<td>upper ribs</td>
<td>coracoid process and crest of tuberculum majus</td>
</tr>
<tr>
<td>Sterno-clavicularis anticus</td>
<td>Bryce</td>
<td>anterior sternoclavicular ligament, Cartilage of the first rib</td>
<td>lateral end of the clavicle</td>
</tr>
<tr>
<td>Axillary arch</td>
<td>Wilson</td>
<td>latissimus dorsi</td>
<td>pectoral major muscle, coracobrachialis or short head of biceps</td>
</tr>
<tr>
<td>Sternalis</td>
<td>Cunningham</td>
<td>sternum, infracloacvic area</td>
<td>rectus sheet, costal and external oblique aponeurosis</td>
</tr>
<tr>
<td>Infraclavicularis</td>
<td>Testut</td>
<td>middle third of clavicle</td>
<td>fascia of deltoid</td>
</tr>
</tbody>
</table>

Normally, skeletal muscles have their origin and insertion on two distinct bones and their function is to move a joint. The muscle presented in this paper is different. It originates from a bone and inserts on a muscle fascia. Testut and Le Double called it “tenseur de l’aponévrose sous-claviculaire antérieure”. The muscle is very thin and absent in the big majority of individuals. We therefore think that it has no specific function. As suggested by Huntington it is probably rather a fortuitous variation and the result of a disturbance of the normal processes of pectoral muscular development.

Del Sol and Vasquez stated that the important aspect of supernumerary pectoral muscles is that they might confuse the surgeon or make the surgical access to the content of the axillary fossa more difficult (13). The infradavicularis muscles presented in this case report were superficial and easy to recognize during careful dissection of the delto-pectoral interval. They aroused our interest but caused no additional problems for the identification of the anatomical landmarks or the implantation of the prostheses.

Conflict of interest

No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article. The authors have no conflict of interest.

References
