Case Report

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An accessory muscle of the thoracic wall

Published online August 24th, 2009 © http://www.ijav.org

Michelle A. HARDY	ABSTRACT
Philip A. FABRIZIO + Georgia State University, Division of Physical Therapy, Atlanta, GA, USA.	In addition to identifying a pectoralis quartus muscle variation, an additional variation of the anterior thoracic wall that has not been reported in the literature was found in a 60-year-old male cadaver. The accessory muscle originated from the aponeurosis of the external abdominal oblique and inserted on the fascia overlying the coracobrachialis muscle. Additionally, the co-existence of an accessory muscle and pectoralis quartus has not been previously described. The current findings and the clinical significance are discussed as a single muscle variation and as two muscle variations in combination. © IJAV. 2009; 2: 93–95.
 ← Dr. Phillip Fabrizio, PT, DPT, MS Georgia State University Division of Physical Therapy P.O. Box 4019 Atlante, 6A, 30302, USA. ☎ +1 404 413-1284 ☑ plabrizio@gsu.edu 	
Received April 28th, 2008; accepted August 21st, 2009	Key words [pectoralis major muscle] [pectoralis quartus] [pectoral variation] [accessory muscle] [thoracic wall]

Introduction

Customary dissection in the Physical Therapy Anatomy Laboratory yielded a unilateral left-sided pectoral variation in a single cadaver. The cadaver was a 60-yearold Caucasian male. The variant included two separate thoracic wall muscles between the pectoralis major and pectoralis minor muscles. One muscle was identified as a pectoralis quartus and the other as an accessory thoracic wall muscle. Although there are many pectoral variations documented in the literature, to the authors' knowledge, there are none identical to the current case.

Case Report

The cadaver specimen investigated contained two variant muscles deep to the pectoralis major muscle. The first variant, determined to be a pectoralis quartus, was located medial on the thoracic wall overlying the origin of the pectoralis minor while the second variant, an accessory muscle, was found just lateral to the pectoralis minor (Figure 1). The pectoralis quartus arose from the 5th costal cartilage, coursed nearly parallel to the pectoralis minor and inserted in the fascia overlying the coracobrachialis muscle deep to the pectoralis major tendon as is customary of the pectoralis quartus variation [1]. The accessory muscle originated from the aponeurosis of the external abdominal oblique muscle, coursed lateral to the pectoralis quartus and inserted into the coracobrachialis fascia deep to the insertion of the pectoralis quartus. The distal end of the accessory muscle "twisted" as it entered its insertion so that the

deep surface faced anterior at the most distal point of the muscle (Figure 1). The innervation of the accessory muscle was demonstrated as being provided by two branches of the medial pectoral nerve that pierced the pectoralis minor to enter the accessory muscle approximately at the midpoint (Figure 2).

Discussion

The pectoral muscles form the anterior wall of the axillary region and lie along the thoracic cavity shaping the chest wall. The pectoralis major is described as having a clavicular head and a sternocostal head [2,3]. The clavicular head originates from the anterior surface of the medial half of the clavicle, and the sternocostal head originates from the anterior surface of the sternum, costal cartilages of the 2nd through 6th ribs, and the aponeurosis of the external oblique muscle [2,3]. The pectoralis major inserts on the lateral lip of the intertubercular groove of the humerus [2,4,5]. The pectoralis minor originates on the 3rd-5th ribs near the costal cartilages and inserts at the medial and superior surfaces of the coracoid process of the scapula [2]. The pectoralis minor acts to assist with stabilizing the scapula and controlling motion as the arm reaches forward by pulling the scapula inferiorly and anteriorly against the thoracic wall [2]. The pectoralis minor is a commonly used landmark during surgery of the axillary region, thus an anatomic variation in this region should be considered to prevent confusion or complications during surgical procedures in this area [2].

EAO AM BO CB

Figure 1. Photograph of the thoracic wall on the left side of the specimen. Note that the pectoralis major has been completely removed. (*PM: pectoralis minor; PQ: pectoralis quartus; AM: accessory muscle; EAO: external abdominal oblique; CB: coracobrachailis; *: "twist" in the accessory muscle)*

Innervation to pectoralis major is supplied by the lateral and medial pectoral nerves at all segmental levels, while pectoralis minor is typically supplied by the medial pectoral nerve from levels C8–T1. The clavicular head of pectoralis major is typically innervated by C5–C6, while the sternocostal head is innervated by C7–T1 [2,4].

Previous pectoralis quartus findings have described the origin as the rectus sheath, the lateral border of the pectoralis major, or the costal cartilages of ribs 5 and 6, and the insertion as pectoralis major or the tendon of the short head of the biceps muscle [6,7]. In the pectoralis quartus muscular variation investigated in the current case, the insertion was similar to that of previous authors, however the pectoralis major did not show the lack of twisting usually present in conjunction with the pectoralis quartus muscle [3].

Arican et al. described the presence of the pectoralis quartus in concurrence with the pectoralis intermedius in a female cadaver. However, the pectoralis intermedius origin was the 3rd and 4th ribs, whereas the accessory muscle found in the current specimen originated from the external oblique aponeurosis. In addition, the pectoralis intermedius inserted on the tendon of the short head of the biceps brachii musculature and not on the coracobrachialis fascia, as in the current case [6]. The innervation to the pectoralis quartus has been discussed as the "most caudal pectoral nerve", the "fourth intercostal nerve", and the "lateral pectoral nerve" in previous literature [6-8]. In the current case the pectoralis quartus and the accessory muscle were innervated by branches of the medial pectoral nerve that had coursed through the pectoralis minor.

The pectoralis quartus and the accessory muscle bellies ran nearly parallel to the pectoralis minor, and thus may serve a similar function to pectoralis minor. However, because they did not insert at the coracoid process it is unlikely the variant muscles served the same function of pectoralis minor during scapular stabilization.

The pectoralis quartus and the accessory muscle, may also contribute to pain caused by myofascial trigger points. Myofascial trigger points are hyper-irritable spots within taut bands of skeletal muscle that commonly refer pain to other areas of the body. Treatment of myofascial trigger points is dependent upon knowing the origin of the pain [9]. If the pain is originating from one of the two muscular variations described and the clinician is unaware of the presence of such variations then the referral pattern of pain may be misleading and cause a misdiagnosis or prolonged treatment for an incorrect condition.



Figure 2. Photograph of the thoracic wall on the left side of the specimen showing the innervation to the accessory muscle. (PM: pectoralis minor; PQ: pectoralis quartus, reflected; AM: accessory muscle, reflected; MPN: branches of the medial pectoral nerve)

It is also important for surgeons and primary care physicians to be aware of the possible presence of the variant muscles so as to not mistake them for lymph nodes or other structures when doing a physical exam or preparing for a surgical intervention in the thoracic region.

The pectoralis quartus present in the current case along with a thoracic wall accessory muscle is an important anatomic

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variation to note. Although the prevalence of pectoralis quartus has been frequently documented, the presence of a co-existing variant, such as the accessory muscle noted, has been less recognized and should be considered in clinical study and patient treatment.

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