

Case Report

Bilateral variation in origin of pectoralis minor

Manisha B. Sinha*, Abu Ubaida Siddiqui, Mrithunjay Rathore, Soumitra Trivedi and
Dhanesh Kumar Sharma

Department of Anatomy, All India Institute of Medical Sciences (AIIMS), Tatibandh, GE Road, Raipur, Chhattisgarh 492099, India

*Correspondence Info:

Dr. Manisha B Sinha
Assistant Professor,
Department of Anatomy,
All India Institutes of Medical Sciences, Raipur, Chhattisgarh, India PIN-492099
Email: manishab80@gmail.com

Abstract

Bilateral variation in origin of pectoralis minor is not reported commonly. Higher origin would likely to restrict the movement of shoulder especially abduction and lateral rotation. Origin of pectoralis minor from 2nd to 4th ribs and costochondral junction is recognized in 15% cases. This could press on excessive stretch to the neurovascular structures, thereby giving rise to neurological and vascular symptoms in the arm. This case report is demonstrating need for continued reporting of anatomical variation and ongoing discussion of their functional and clinical significance.

Keywords: pectoralis minor, pectoralis major, axillary artery, brachial plexus

1. Introduction

Bilateral higher origin of pectoralis minor (Pm) is not very common. Pectoralis minor (Pm) lies deep to pectoralis major (PM). It's not more than a small lateral part being visible before the pectoralis major is reflected. It is enclosed by a fascial envelop continuous with the clavipectoral fascia, this envelop splitting at one border of the muscle and uniting at the other border. Pectoralis minor (Pm), usually arises from 3rd, 4th, 5th ribs and costal cartilages, turns upward and laterally to be inserted by its apex into coracoid process of scapula. It crosses two important structures axillary artery and the brachial plexus of nerves. It is used while describing axillary artery.¹ Our aim is to report variation in origin of Pm which lends a hand to clinician in making diagnosis problem related to compression of axillary artery and brachial plexus.

2. Case Report

During the regular dissection procedure in anatomical laboratory of All India Institute of Medical Sciences, Raipur, CG, India, a male cadaver of age 60 year showed bilateral variation in origin of pectoralis minor (Pm) (figure1). In this case we found Pm arises from 2nd to 4th ribs and costochondral junction bilaterally. On both side, insertion was on coracoid process of scapula and was supplied by medial pectoral nerve.

Figure 1: Dissected pectoral region showing higher origin of pectoralis minor from 2nd, 3rd, and 4th costal cartilages



PM: Pectoralis major,
Pm: Pectoralis minor

3. Discussion

The pectoral muscles develop from the pectoral premuscle mass.² This pectoral premuscle mass lies in the lower cervical region on the medial side of the arm bud. It is widely continuous with the arm premuscle sheath, and lies almost entirely anterior to the 1st rib. In an CRL:11 mm (crown rump length) embryo it reaches about the level of the 3rd rib, but the two muscles still form a single columnar mass attached to the humerus, to the coracoid process, and to the clavicular rudiment. As the mass differentiates, it flattens out and extends caudoventrally to the region of the distal ends of the upper ribs. The caudal end of the muscle extends near to the tip of the 5th rib and the muscle begins to assume the adult form, with fibres arising from front of the upper five ribs and sternal angle as well as from the clavicle. At this stage the proximal portion of the muscle has split into the major and minor portions, the one attached by tendon to the humerus and the other to the coracoid process. Both muscles fuse together near the costal attachments. In a CRL:16 mm embryo the two muscles are quite distinct, the pectoralis major now extending to the 6th rib and showing a distinct cleavage between the costal and clavicular portions. The pectoralis minor muscle has now its distinct attachment to the 2nd, 3rd, and 4th ribs.⁵ If this embryological origin persists later in adulthood that's what we had found. However, some endogenous and exogenous factors can cause total or partial agenesis of pectoral muscles or development of various abnormalities.³

In our case of bilateral higher origin of Pm, hyperabduction and lateral rotation of the shoulder would likely to press and excessive stretch to the neurovascular structures, thereby giving rise to neurological and vascular symptoms in the arm.⁴ Gennaro *et al*⁵ who described cases of patients in whom abduction of the limbs were restricted as a result of the presence of chondroepitrochlearis muscles. In both of these cases the full range of motion was achieved after surgical tenomyotomy. In our case it is unknown that whether restriction of movement was there or not. The tear of Pm is not uncommon in football player. Zvijac *et al*⁶ reported two cases of Pm tear. Probability of tear is higher in patient with higher origin.

Anson *et al*⁷ found higher origin of pectoralis minor (origin from 2nd, 3rd, and 4th costal cartilages) in 15% cases. They did not describe the laterality of cases. Here we found bilateral higher origin of Pm.

This case report is demonstrating need for continued reporting of anatomical variation and ongoing discussion of their functional and clinical significance.

References

1. Snell, Richard S. "The Upper Limb". Clinical anatomy by regions. Philadelphia, Pa. Lippincott Williams & Wilkins, 2012. 344.
2. Lewis, W. H. In Mall and Keibel's Manual of Human Embryology. Philadelphia, 1910. V. 1. p. 487.
3. Yamasaki, M. Anatomical study on 2 cases of the congenital partial defect of pectoralis major and minor muscles. *Anat. Anz.*, 168:423-32, 1989.
4. Daskalakis, M. K. Thoracic outlet compression syndrome: current concepts and surgical experience. *Int. Surg.*, 68:337-44, 1983.
5. Di Gennaro GL, Soncini G, Andrisano A, Valdiserri L. The chondroepitrochlearis muscle: case report. *Chir Organ Mov*, 1998; 83: 419-423.
6. Zvijac J E, Zikria B, Bemden A B. Isolated tears of pectoralis minor muscle in professional football players:a case series. *Am J Orthop* (Belle Mead NJ). 2009 Mar; 38(3):145-7.
7. Anson B J, Beaton L E, McDonald J J. The origin of the m. Pectoralis minor, *The Anatomical notes*. 629-630.