

Axillary arch muscle: a case report

Kamal Kataria, Anurag Srivastava and Amitabha Mandal

Department of Surgical Disciplines, All India Institute of Medical Sciences, New Delhi, India

SUMMARY

An axillary arch is a regional muscle variation of the axilla. It is an additional muscle bundle which may extend from the *latissimus dorsi* to the *pectoralis major* in the anterior fold, to the short head of the *biceps brachii* or to the coracoid process. In the present case report, a 40 year-old female presented with a complaint of a right breast lump, which was gradually increasing in size. On triple assessment, it was diagnosed as an invasive ductal carcinoma of the breast. She underwent Skin Sparing Mastectomy and axillary lymph node dissection. While doing axillary lymph node dissection, we encountered an abnormal bundle of muscle fibre crossing the axilla from the *latissimus dorsi* muscle to the posterior surface of the right *pectoralis major* muscle. It is important that surgeons should be aware of axillary arch while operating in the axilla, as it may lead to development of a different type of pathology of the axillary fossa and its constituents.

Key words: axillary arch muscle – langer's arch – lymphadenectomy

INTRODUCTION

The axilla contains various neurovascular elements and lymph node structures. There may be regional muscle variations in relation to these elements (Wood, 1868; Macalister, 1875). This regional muscle variation may lead to the development of different types of pathology of the axillary fossa and its constituents. An axillary arch is an additional muscle bundle of various dimensions extending from the *latissimus dorsi* to the

pectoralis major in the anterior fold, to the short head of the *biceps brachii* or to the coracoid process (Yuksel et al., 1996; Kalaycioglu et al., 1998). It is also known as *Achselbogen*, *arcus axillaris*, the pectodorsal muscle and the axillopectoral muscle (Kalaycioglu et al., 1998). Ramsay (1812) was the first author to observe this anomaly, and stated that in 1795 he had observed an oblong muscle that stretched from the *pectoralis major* to the *latissimus dorsi* and the *teres major*. However, the muscle has been named after Langer, who gave the first description of the muscle in 1846 (Bonastre et al., 2002). In the literature, the incidence of axillary arch varies from 7% to 8%, more frequently unilateral and rarely bilateral (Perre and Zoetmulder, 1989; Kutiyanawala et al., 1998). Knowledge of the existence and the arrangement of axillary arch is important, as it may hinder the exposure of the axillary structures, creating difficulty and confusion at the time of lymphadenectomy, or may compress and injure the neurovascular structures of the axilla. Our report describes an axillary arch muscle arising from the *latissimus dorsi* and inserting into the posterior aspect of the *pectoralis major* muscle in the axilla.

CASE REPORT

A 40-year-old female presented with a complaint of a right breast lump of size 4.5 x 3.5 cm since 2 months. It was gradually increasing in size and was associated with pain. There was no history of any comorbid illness. She was evaluated with mammography and trucut biopsy. Mammography suggested a BIRADS V lesion in the upper inner quadrant of breast. Trucut biopsy showed an infiltrating ductal carcinoma of the breast. Ultrasound examination of the breast suggested a multicentric lesion of the right breast. She was planned for sentinel lymph node biopsy and right Skin Sparing Mastectomy. During senti-

Corresponding author: Kamal Kataria. Department of Surgical Disciplines, All India Institute of Medical Sciences, Ansari Nagar New Delhi, India – 110029.
Tel: +91 11-26260434.
E-mail: drkamalkataria@gmail.com

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nel lymph node biopsy sentinel lymph nodes were found at an abnormal location in the breast tissue over the anterior surface of the right *pectoralis major* muscle. While doing axillary lymph node dissection, we encountered a bundle of muscle fibre crossing the axilla from the *latissimus dorsi* muscle to the posterior surface of the right *pectoralis major* muscle (Fig. 1A). All neurovascular structures and axillary lymphoid tissue were lying posterior to this abnormal muscle (Fig. 1B).

DISCUSSION

Arch-shaped variations in the axilla could be considered in two groups, namely muscular form (type I) and tendinous form (type II), accompanying different subtypes based on their nerve supplies and site of their attachment points (Takafuji et al., 1991). In a study, there was an abnormal band of muscle and/or tendon across the axilla during axillary dissection in 100 patients of breast cancer. It was concluded that it may arise from the *latissimus dorsi* muscle, and cross the axilla medially to insert into the coracoid process or to the *pectoralis major* (Kutiyanawala et al., 1998). However, clinical classification of the axillary arches could be defined as superficial and deep arch groups. Superficial group arches cross in front of the vessels and nerves, and the veins could be affected primarily within this variation, which may play a role in intermittent obstruction of the axillary vein (Jelev et al., 2007). Deep group arches occur deeply on the posterior or lateral walls of the axilla. These arches usually cross only parts of the neurovascular bundle, and axillary or radial nerves could possibly be affected.

Langer's arch can occasionally be palpable during routine clinical examination when presenting as an axillary mass; it can be confused with en-

larged lymph nodes or soft tissue tumour. This muscular slip related to the *latissimus dorsi* muscle could be seen in the axillary region on mammography. CT or MRI is furthermore helpful for definitive evaluation (Bakirci et al., 2010).

The presence of the axillary arch may precipitate lymphoedema of the arm in cases where *latissimus dorsi* myocutaneous flap is used for breast reconstruction. For this reason, if the axillary arch is found at axillary dissection, it should be divided if there is a possibility of a *latissimus dorsi* flap being required in the future (Petrasek et al., 1997). The anomalous axillopectoral muscle may be the reason of a high-grade intermittent obstruction of the axillary vein as described by Boontje (1979) in his case report. The most common reason of median nerve compression at the level of the axilla has been also reported as being caused by anomalous axillary arch muscles in many cases (Weinzweig and Browne, 1988). The axillary arch covers a small group of lateral axillary lymph nodes as it courses over the axillary vein (Petrasek et al., 1997). Its presence may lead to confusion in staging lymph nodes (Kutiyanawala et al., 1998). If an axillary arch is encountered during axillary lymphadenectomy, the lymph nodes posterior and lateral to the arch should be excised. Missing these nodes during axillary node dissection predisposes to local recurrence in patients with melanoma and breast cancer, and also inaccurate staging information could negatively affect systemic treatment decisions for breast cancer after surgery (Petrasek et al., 1997). Beside this, injury of the axillary vessels and the brachial plexus may appear, unless it is recognized before surgery, because of the possibility of mistaking the arch for the true lateral edge of the *latissimus dorsi* muscle, and then dissecting along the arch cephalad (Kutiyanawala et al., 1998; Petrasek et al., 1997; Babu and

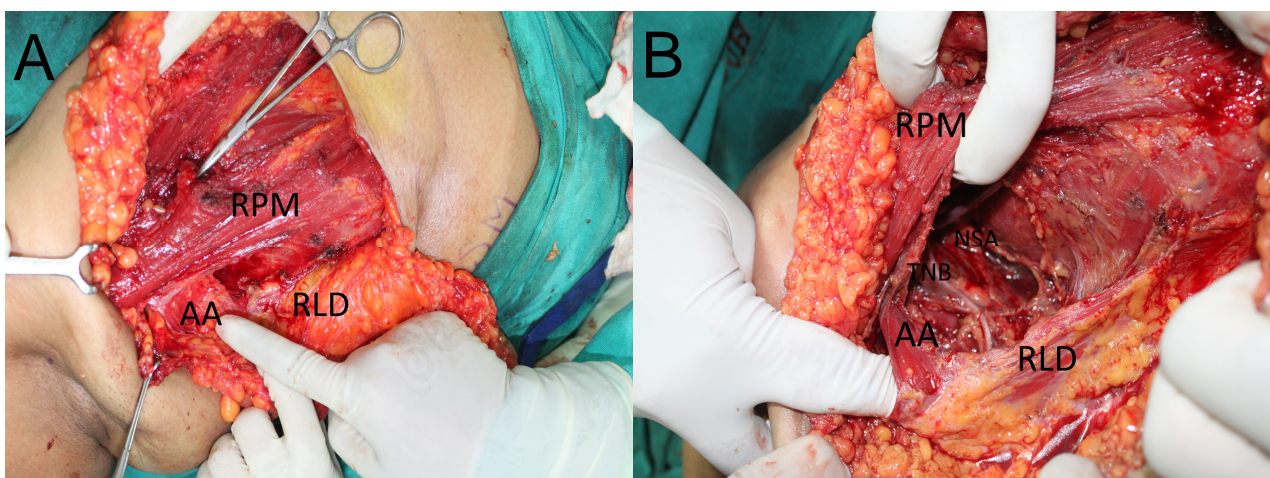


Fig. 1. (A) Axillary arch muscle extending between *pectoralis major* muscle to *latissimus dorsi* muscle in right axilla, AA – Axillary Arch, RPM – Right pectoralis major, RLD – Right Lattismus dorsi muscle. (B) Posterior relation of right axillary arch muscle fibres, TNB – Thoracodorsal neurovascular bundle, LTN – Long thoracic nerve.

Khashaba, 2000).

REFERENCES

- BONASTRE V, RODRÍGUEZ-NIEDENFÜHR M, CHOI D, SANUDO JR (2002) Coexistence of a pectoralis quartus muscle and an unusual axillary arch: case report and review. *Clin Anat*, 15: 366-370.
- BOONTJE AH (1979) Axillary vein entrapment. *Br J Surg*, 66: 331-332.
- BABU ED, KHASHABA A (2000) Axillary arch and its implications in axillary dissection-review. *Int J Clin Pract*, 54: 524-525.
- BAKIRCI S, KAFA IM, UYSAL M, SENDEMIR E (2010) Langer's axillary arch (axillopectoral muscle): a variation of latissimus dorsi muscles. *Int J Anat Variat*, 3: 91-92.
- JELEV L, GEORGIEV GP, SURCHEV L (2007) Axillary arch in human: common morphology and variety. Definition of "clinical" axillary arch and its classification. *Ann Anat*, 189: 473-481.
- KALAYCIOGLU A, GUMUSALAN Y, OZAN H (1998) Anomalous insertional slip of latissimus dorsi muscle: arcus axillaris. *Surg Radiol Anat*, 20: 73-75.
- KUTIYANAWALA MA, STOTTER A, WINDLE R (1998) Anatomical variants during axillary dissection. *Br J Surg*, 85: 393-394.
- MACALISTER A (1875) Additional observations on muscular anomalies in human anatomy (3rd series) with a catalogue of the principal muscular variations hitherto published. *Trans Royal Irish Acad*, 25: 1-134.
- PERRE CI, ZOETMULDER FA (1989) A bilateral axillopectoral muscle. *Neth J Surg*, 41: 49.
- PETRASEK AJ, SEMPLE JL, MCCREADY DR (1997) The surgical and oncologic significance of the axillary arch during axillary lymphadenectomy. *Can J Surg*, 40: 44-47.
- RAMSAY A (1812) An account of unusual conformations of some muscles and vessels. *Edinburgh Med Surg J*, 8: 281-283.
- TAKAFUJI T, IGARASHI J, KANBAYASHI T, YOKOYAMA T, MORIYA A, AZUMA S, SATO Y (1991) The muscular arch of the axilla and its nerve supply in Japanese adults. *Kaibogaku Zasshi*, 66: 511-523.
- WEINZWEIG N, BROWNE EZ (1988) Infraclavicular median nerve compression caused by a lipoma. *Orthopedics*, 11: 1077-1078.
- WOOD J (1868) Variations in human myology observed during the winter session of 1867-68 at King's College, London. *Proc Roy Soc (London)*, 16: 483-525.
- YUKSEL M, YUKSEL E, SURUCU S (1996) An axillary arch. *Clin Anat*, 9: 252-254.