CASE REPORT

Accessory lateral pectoral nerves supplying the pectoralis major

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Abstract

Certain surgical treatment failures of the brachial plexus lesions are due to the presence of anatomical variations. Anatomical knowledge of the pectoral nerves is of clinical importance during mastectomy, neurotization or other surgical procedures in the axilla. The present case describes three nerves arising from the lateral cord of brachial plexus supplying the pectoralis major muscle one below the other which was observed during routine dissection for undergraduate students. Knowledge of certain variations as in the present case may be advantageous for cosmetic augmentations during radical mastectomy where pectoralis major can be preserved because of its additional nerve supply in the lower part.

Keywords: pectoral nerve, accessory, variations, mastectomy, reconstructive surgery.

Introduction

As per most of the anatomy textbooks, a single lateral pectoral nerve arises from the lateral cord of brachial plexus and supplies the pectoralis major. Hollinshead WH described that the lateral pectoral nerve may arise by one root from lateral cord or two roots from the anterior division of upper and middle trunks [1]. Kerr AT described a case in which lateral pectoral nerve arose as two separate branches from the anterior divisions of upper and middle trunks [2]. Lateral pectoral nerves arise from the anterior division of upper trunk in 44%, from the middle trunk in 55% of the cases studied by Fazan VPS et al. [3].

The present case describes three pectoral nerves arising from the lateral cord of brachial plexus, one below the other, and supplying the pectoralis major, which was detected during routine cadaveric dissection for undergraduate students. The position of the branches of the lateral pectoral nerve to the pectoralis major muscle is important to propose the surgical technique for the transfer of pectoralis major island flap to the head and neck area through a tunnel in the deltopectoral groove [4].

Material and Methods

During routine dissection of the axilla for undergraduate medical students in Kasturba Medical College, other than a normal pectoral nerve arising from the lateral cord of brachial plexus, two additional nerves were detected from the lateral cord in a formalin fixed cadaver.

Results

As mentioned above three pectoral nerves were arising from the lateral cord on the right side one below the other (Figure 1, “a-c”). The first branch (a) was thicker, supplied the upper part of pectoralis major. The second branch (Figure 1, “b”) was 1 cm below the first branch. The third branch was seen near the lower part of pectoralis major (Figure 1, “c”).

Another separate branch from the lateral cord was connected with the medial pectoral nerve looping round the second part of axillary artery (Figure 1, “d”).

Discussion

Anomalies of brachial plexus and its terminal branches are not uncommon and have been widely documented [1, 2]. However, three pectoral branches from the lateral cord supplying the pectoralis major, as in the present case, have not been reported earlier. The presence of accessory nerves supplying pectoralis major, as in our case, may minimize the risk surgical paralysis of the muscle. During radical mastectomy or other cosmetic surgery, denervation of lower part of the pectoralis major frequently occurs and may reduce muscle spasm, with consequent better reconstruction of the breast [5].

Because injury to the lateral pectoral nerve results in atrophy of clavicular head of pectoralis major and part of sternal head [6]. However, presence of a nerve supplying the lower part of pectoralis major, as in the present case, may increase the possibility of surgical failure during reconstructive surgery.

It is a known fact that normal and anomalous positions of the arteries and veins may be determined preoperatively by angiographic studies, but in case of nerves it is not feasible to detect such anomaly. It is only at the time of surgery that the surgeons are exposed to such variations [7].
Gupta M et al. have reported that two lateral pectoral nerves arose as two separate branches from the anterior divisions of upper and middle trunks respectively [8].

Knowledge of certain variations as in the present case may be advantageous for cosmetic augmentations during radical mastectomy where pectoralis major can be preserved because of its additional nerve supply in the lower part.

Muscles of the limbs are derived from somatic precursor muscle cells from the somites opposite the developing limbs. Somites have a specific effect on the position of the developing spinal nerves, which preferentially grow through the cranial half of the nervous system [9].

The nerve cords from the spinal nerves that correspond to the early extent of limb buds grow distally into intermuscular spaces and end in a premuscle mass. The guidance of the developing axons is regulated by expression of chemoattractants and chemorepulsants in a highly coordinated site-specific fashion [10]. Altered coordination between messages from mesenchymal cells and neuronal growth cones can lead to significant variations [11, 12].

Reports in the extensive medical literature also reveal that pectoralis major myocutaneous flap is the most commonly used flap in head and neck reconstructive surgery. The pectoralis major myocutaneous flap with its abundant tissue and excellent blood supply and anatomic proximity provide a simple, reliable, and versatile method of primary reconstruction of various head and neck defects [13–15].

Additionally, the pectoralis major myo-cutaneous island flap is useful for axillary reconstruction following resection of tumor and skin in the axilla. It is a useful alternative to the latissimus dorsi flap, particularly when the vascular pedicle of the latissimus dorsi muscle is infiltrated by tumor [16]. According to Wadwongtham W et al., the pectoralis major myocutaneous flap should be the suitable flap for the advanced-staged cancer patient with a limited life expectancy [17].

5 Conclusions

Knowledge of certain variations, as in the present case, may be advantageous for cosmetic augmentations during reconstructive surgery where pectoralis major can be preserved because of its additional nerve supply in the lower part.

References

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