An aberrant independent origin of the serratus anterior pedicle: Case report

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SUMMARY

During routine dissection of the right upper limb in a male cadaver by the medical students in the department, an unusual artery was found on the side of the chest wall. The anomalous, aberrant artery was the first branch from the first part of the axillary artery. It crossed deep to the superior thoracic and lateral thoracic arteries, passed in front of the subscapular artery on the serratus anterior muscle and terminated, distributing that muscle, opposite the 8th intercostal space. There are known vascular anatomical variations in the supply to the serratus anterior. Due to serratus anterior or serrato-costal flap reconstructive surgery, an anomalous and aberrant vascular pedicle to the serratus anterior muscle is of interest to anatomists, surgeons, reconstructive surgeons and radiologists.

Key words: Axillary artery – Reconstruction – Serratus anterior pedicle – Thoracodorsal artery

INTRODUCTION

The serratus anterior muscle has been used as a flap for reconstruction. It is a reliable muscle flap with a consistently long pedicle, excellent malleability, and multipennate anatomy, permitting the coverage of complex three-dimensional wounds. The subscapular artery is the largest branch from the third part of the axillary artery; it divides into the circumflex scapular artery and the thoracodorsal artery, which follows the lateral border of the scapula between the latissimus dorsi and serratus anterior muscles and supplies these two muscles: teres major muscle and intercostal muscles. The lateral thoracic artery, which is a branch from the second part of the axillary artery, supplies the serratus anterior, pectoral muscles and the subscapularis muscle (Gabella, 1995).

MATERIAL AND METHODS

During routine dissection of the right upper limb of a male cadaver by the medical students in the department, an unusual artery was found on the side of the chest wall. A careful dissection was made to trace it proximally and distally. The branches of the axillary artery were also traced.

OBSERVATIONS

The superior thoracic, acromiothoracic, and lateral thoracic arteries were normal. The subscapular artery, from the third part of the axillary artery, gave the circumflex scapular artery, and the thoracodorsal artery continued along the lateral border of the scapula, supplying the subscapularis and latissimus dorsi muscles. The aberrant artery to the serratus anterior muscle, 19 cm long and larger than the subscapular artery, was the first branch from the first part of the axillary artery (Fig. 1); it passed crossing deep to the superior thoracic and lateral thoracic arteries and continued, in front of the subscapular artery, on the serratus anterior muscle and terminated, distributing that muscle opposite the 8th intercostal space.
DISCUSSION

Variations of the serratus anterior pedicle

There are known vascular anatomical variations in the supply to the serratus anterior. The blood supply to the serratus anterior may come from the thoracodorsal pedicle, from the subscapular pedicle, or directly from the axillary artery. The most common pattern is the serratus anterior branch, which comes from the thoracodorsal artery and, more rarely, from the subscapular or axillary arteries. An independent artery from the first intercostal artery supplies the serratus anterior muscle (De Fontaine et al., 1994). The main blood supply to the serratus anterior comes from the lateral thoracic artery (Percival and Earley, 1989; Lipa and Chang, 2001). An aberrant, independent serratus anterior pedicle has been reported to originate directly from the subscapular artery from the proximal third of the axillary artery; the thoracodorsal artery arose separately, directly from the distal third of the axillary artery (Goldberg, 1990). This anomaly of the subscapular vascular tree has not been reported previously and this vascular pattern was not encountered in any previous patient in the series of serratus anterior muscle transfers.

Application of the serratus anterior for flap reconstruction

The serratus anterior muscle is used for flap reconstruction of lower limbs (Saeed et al., 2002), dorsal surface hand defects (Fassio et al., 1999), head, neck and extremity injuries (Kim et al., 1999), bony and soft tissue defects in the face, the lower extremities and first metacarpal defects (Hui et al., 1999), bony and soft tissue defects in the face, the lower extremities and first metacarpal defects (Hui et al., 1999), small to moderate-sized defects (Cuadros et al., 1995), complex three-dimensional wounds of the face and limbs (Sabri et al., 1993), the mandible (Breton et al., 1992; Richards et al., 1985), and head and neck, chest wall (Vu et al., 1989) and vascular reconstruction and revascularization of extensive ischemic areas such as cerebral hemispheres (Yoshioka et al., 1996).
Present case

The serratus anterior pedicle was the first branch from the first part of the axillary artery. A similar vascular pattern has only been reported once previously (De Garis and Swartley, 1928). It is a very rare aberrant artery. Embryologically, the persistence of various segmental arteries in the axilla seems to be responsible for the anomalies described (Lengale and Dhem, 1989). Due to potential serratus anterior or serrato-costal flap reconstructive surgery, an anomalous and aberrant vascular pedicle to the serratus anterior muscle is important and is of interest to anatomists, surgeons, and radiologists. It is suggested that these anomalies should be evaluated pre-operatively. Reconstructive surgeons should be aware of possible variations in the vascular anatomy of the flap.

REFERENCES


