

## The cutaneous branch of some human suprascapular nerves

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### INTRODUCTION

Not one of over 40 textbooks of human anatomy consulted by the author mentioned a cutaneous branch from the suprascapular nerve in man. In 1968, however, Muneshato Yamada discovered such a branch and named it the 'Nervus cutaneus subacromialis', giving a brief account of it in his mimeographed *Manual of Anatomical Dissection* used at the Kanazawa University School of Medicine. The present author found a suprascapular nerve with a cutaneous offshoot in a Japanese cadaver in the dissecting room of the same University in 1975, and in 1976 discovered a cutaneous offshoot from a suprascapular nerve in the right (Case 1) and left (Case 2) arms of a male Japanese cadaver. Subsequently the author examined four other examples of this variation (Cases 3, 4, 5 and 6). It would appear that a cutaneous branch of the suprascapular nerve in man is not uncommon, though it is much more common in lower primates (Bolk, 1902). The present paper reports the author's observations on the cutaneous branch of the suprascapular nerve in man.

### MATERIALS

Observations were made on five Japanese dissecting room cadavers (Table 1).

Table 1. *Details of subjects with cutaneous branches of suprascapular nerve*

Cadaver	Sex	Age	Side	Case number	Nerve fibres potentially involved
1	Male	81	Right	1	
			Left	2	C4, 5, 6
2	Female	90	Left	3	C4, 5
3	Male	73	Right	4	C4, 5, 6
4	Male	57	Left	5	C4, 5, 6
5	Male	79	Right	6	C5, 6

### OBSERVATIONS

In Case 1 the cutaneous branch of the suprascapular nerve was unsuitable for detailed examination because the arm had been dissected before the variation was noticed. The following description is therefore based on Cases 2–6, especially Case 2.

#### *Origin of the suprascapular nerve concerned*

In Cases 2, 4, 5 and 6 the ventral rami of the fifth and sixth cervical nerves as usual joined together to form the superior trunk of the brachial plexus. In Cases 2, 4 and 5

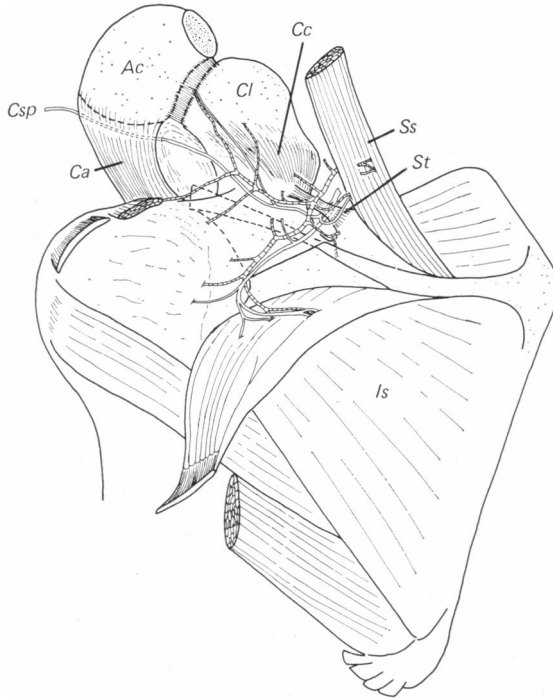


Fig. 1. Posterior view of the shoulder in Case 2. The trapezius muscle has been removed. The supraspinatus (*Ss*) and the infraspinatus (*Is*) muscles have been cut through near their insertions and reflected toward their origins. The acromion (*Ac*) has been sawn through near its junction with the spine of the scapula and reflected anteriorly together with the clavicle (*Cl*). *Ca*, coracoacromial ligament; *Cc*, coracoclavicular ligament; *Csp*, cutaneous branch of the suprascapular nerve; *St*, superior transverse scapular ligament.

the suprascapular nerve derived fibres from the ventral rami of the fourth, fifth and sixth cervical nerves and arose from the lateral aspect of the superior trunk of the plexus close to its bifurcation into ventral and dorsal divisions. In Case 6 the superior trunk of the plexus did not receive fibres from the fourth cervical nerve, and the suprascapular nerve arose from the lateral aspect of the superior trunk a little proximal to its bifurcation. In Case 3 the suprascapular nerve sprang from the lateral aspect of the combined ventral rami of the fourth and fifth cervical nerves a little proximal to its union with the ventral ramus of the sixth cervical nerve. In no case was there any unusual feature in the anatomy of the brachial plexus.

#### *Course of the cutaneous branch of the suprascapular nerve*

After arising from the superior trunk of the brachial plexus or the ventral ramus of the fifth cervical nerve, the suprascapular nerve in all cases pursued a normal course through the scapular notch to the supraspinous fossa, where it supplied upper and lower branches to the supraspinatus muscle and a filament to the shoulder joint. It then descended deep to the supraspinatus and the root of the acromion to the infraspinatus muscle. The cutaneous nerve either arose from the upper branch to the supraspinatus muscle (Cases 2, 3 and 6) or from the stem of the suprascapular nerve (Cases 4 and 5) under the superior transverse scapular ligament (Fig. 1). The branch turned superolaterally along the anterior aspect of the supraspinatus muscle

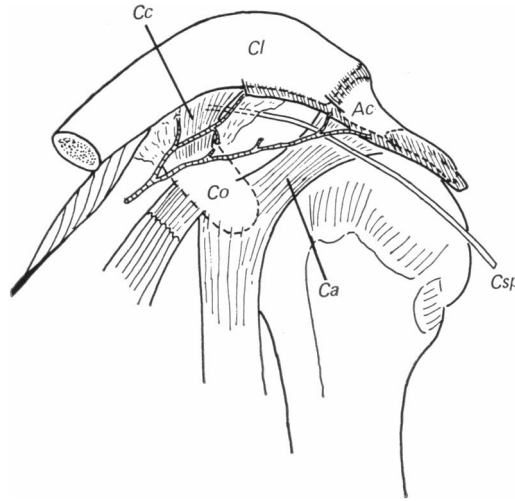


Fig. 2. Anterior view of the shoulder in Case 2. The deltoid muscle has been cut through near its origin and reflected inferiorly. *Ac*, acromion; *Ca*, coracoacromial ligament; *Cc*, coracoclavicular ligament; *Cl*, clavicle; *Co*, coracoid process; *Csp*, cutaneous branch of the suprascapular nerve.

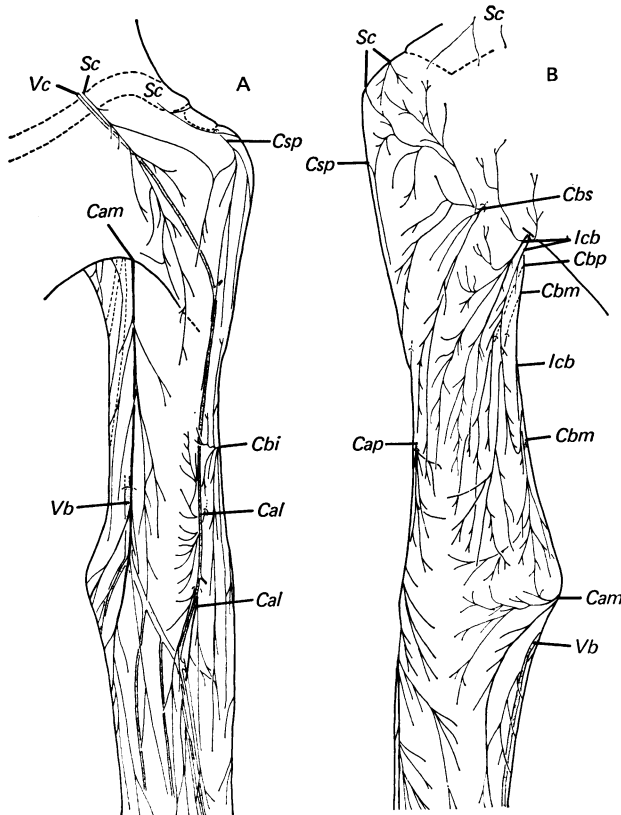


Fig. 3. Anterior view (A) and posterior view (B) of the cutaneous nerves of the upper arm in Case 2. *Cal*, lateral cutaneous nerve of forearm; *Cam*, medial cutaneous nerve of forearm; *Cap*, posterior cutaneous nerve of forearm; *Cbi*, inferior lateral cutaneous nerve of arm; *Cbm*, medial cutaneous nerve of arm; *Cbp*, posterior cutaneous nerve of arm; *Cbs*, superior lateral cutaneous nerve of arm; *Csp*, cutaneous branch of the suprascapular nerve; *Icb*, intercosto-brachial nerve; *Sc*, lateral supraclavicular nerves; *Vb*, basilic vein; *Vc*, cephalic vein.

to the postero-inferior aspect of the coracoclavicular ligament, where it gave a filament to the acromioclavicular joint. It then passed between the coracoclavicular and coracoacromial ligaments, and bending slightly forwards near the tip of the acromion (Fig. 2), pierced the deltoid muscle close to its origin from the tip of the acromion.

*Peripheral distribution of the cutaneous branch of the suprascapular nerve*

The peripheral distribution of the cutaneous branch of the suprascapular nerve was visible only in Case 2 (Fig. 3). At first it adhered closely to the anterolateral surface of the deltoid muscle in a furrow between the muscle fibres beneath the deep fascia. Then it divided in the subcutaneous tissue into several filaments to the proximal third of the lateral aspect of the arm. The most anterior filament communicated with a terminal branch of the lateral supraclavicular nerve, the most posterior with a terminal branch of the upper lateral cutaneous nerve of the arm. One of the main filaments of the cutaneous nerve in question descended along the cephalic vein to terminate in the subcutaneous tissue of the middle third of the lateral aspect of the arm (see also Murakami, Ohtani & Outi, 1977).

The area of distribution of the cutaneous branch of the suprascapular nerve was bounded proximally by the lateral supraclavicular nerves, anteriorly, by the lateral supraclavicular nerves and the medial cutaneous nerve of the forearm, posteriorly, by the upper lateral cutaneous nerve of the arm, and distally, by the lower lateral cutaneous nerve of the arm and the lateral cutaneous nerve of the forearm. Cutaneous twigs from the anterior (superior) branch of the axillary nerve pierced the deltoid to supply skin over the muscle. Two such twigs were observed in Cases 3 and 5, one in Case 6, and none in Case 2. In Cases 1 and 4, they were not sought.

#### DISCUSSION

Murakami *et al.* (1977) detected the cutaneous branch of the suprascapular nerve bilaterally in two males out of 61 Japanese cadavers, i.e. in 4 out of 122 arms, in the course of anatomical dissection for their students at Okayama University in 1976. Case 3 of the present study was the only one among 31 Japanese cadavers in 1977, and Cases 4, 5 and 6 were from 29 Japanese (58 arms) dissected in 1978. In addition, the author saw a slender nerve which might have been another example in an arm of another cadaver: it entered the subcutaneous tissue from the deltoid close to the acromion, but unfortunately could not be followed further.

The cutaneous branch of the suprascapular nerve has been almost entirely ignored in the literature presumably because of (1) the difficulty of dissecting it as it adheres closely to the deltoid muscle; (2) the cutaneous offshoots from the anterior (superior) branch of the axillary nerve which pass through the deltoid muscle and could be confused with the nerve; and (3) the loss of the nerve when the deltoid is divided near its origin in the course of dissection.

The cutaneous branch of the suprascapular nerve has been found bilaterally in three cadavers, two in the study of Murakami *et al.* (1977) and one in the present study (Cadaver 1); and unilaterally in four cadavers. In all four cases of Murakami *et al.* the suprascapular nerve arose from a normal brachial plexus near the confluence of the ventral rami of the fifth and sixth cervical nerves. This is true of the present cases except for one (Case 3) in which it arose from the ventral ramus of the fifth cervical nerve without contribution from the sixth cervical nerve. Thus

the presence of the cutaneous branch of the suprascapular nerve is not associated with significant variations in the brachial plexus.<sup>1</sup>

The course of the cutaneous branch of the suprascapular nerve from its origin to the deltoid muscle is very similar in all the human cases (Murakami *et al.* 1977) and in the Prosimii and monkeys (Bolk, 1902), except that in monkeys the cutaneous branch winds around the anterior border of the deltoid to become subcutaneous.

The peripheral distribution of this cutaneous nerve coincides with that of the axillary nerve in the normal arm. Bolk (1902) found that in Prosimii and New World monkeys the skin area concerned was supplied by the suprascapular nerve, but in Old World monkeys it was supplied by the axillary nerve. He ascribed it to the shift of route of the sensory fibres from the 'prozonal' suprascapular nerve to the closely situated 'metazonal' axillary nerve. Presumably in normal human arms the cutaneous component of the suprascapular nerve must be contained in the axillary nerve.

#### SUMMARY

A cutaneous branch of the suprascapular nerve was observed in 6 arms from 5 (4 male and 1 female) out of 61 Japanese cadavers.

The suprascapular nerves with a cutaneous branch arose from essentially normal brachial plexuses.

Every suprascapular nerve with a cutaneous branch had a normal course, and gave rise to the cutaneous branch either from the upper of its two muscular branches to the supraspinatus or from its stem under the superior transverse scapular ligament. After passing between the coracoclavicular and coracoacromial ligaments the cutaneous branch pierced the deltoid muscle close to the tip of the acromion.

In one case, the peripheral distribution was very carefully dissected, the nerve supplied the proximal third of the lateral aspect of the arm within the territory of the axillary nerve.

A cutaneous branch of the suprascapular nerve is obviously not uncommon, at least in Japanese.

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#### REFERENCES

- BOLK, L. (1902). Der plexus cervico-brachialis der Primaten. *Petrus Camper* 1, 371-567.  
MURAKAMI, T., OHTANI, O. & OUTI, H. (1977). Suprascapular nerve with cutaneous branch to the upper arm. *Acta anatomica nipponica* 52, 96 (Japanese abstract).  
YAMADA, M. (1968). *Manual of Anatomical Dissection*. Kanazawa University School of Medicine. (In Japanese).