

# Importance of medial antebrachial cutaneous nerve anatomical variations in upper arm surgery

Stylianou *et al.* reported the unique case of atypical division of medial antebrachial cutaneous nerve (MACN) to four brachial cutaneous branches and presented a short literature review on MACN anatomical variations. Authors in detail described possible neurological consequences of the iatrogenic injury to the nerve and its branches.<sup>[1]</sup> Their case report is of clinical importance in a multidisciplinary aspect. In trauma patients, an injury to minor nerves is not a critical issue. However, in patients undergoing elective surgery on the upper extremity, iatrogenic nerve injury with eventual, subsequent neurological deficits may be the source of considerable liability and litigation.

Vascular access surgeons during the formation of brachial-basilic and brachial-brachial arterio-venous fistula typically encounter the MACN, and its branches are passing over the basilic and brachial vein. Almost no reports are available in the literature how to technically deal with the MACN during upper arm vascular access surgery. Usually, the special care is advised not to injure the nerve and its branches.<sup>[2]</sup> Specifically, the two-stage methods of brachial-basilic and brachial-brachial fistula creation require surgeon's attention. The second stage of surgery requires an exposure of the entire length of basilic or brachial vein on the arm. It is not an issue, if the surgeon decides to transect the matured vein, tunnel it on the anterior aspect of the arm, thus above the nerve and reanastomose the vein. In simplified transposition techniques, as superficialization and elevation, it is likely to encounter the anatomical conflict between the vein and the nerve. Recently, an elegant neurosurgical technique of axial splitting of the MACN nerve was described.<sup>[3]</sup> This novel technique enables the elevation or superficialization of the vein between the separated nerve branches, without the need to transect and reanastomose the vein. The method significantly shortens the time of the second stage surgery and generally facilitates the procedure. Notably, the authors did not observe any significant neurological deficits during the follow-up.

Other vascular procedures on upper arm as thrombectomy, embolectomy of the brachial artery,

and arteriovenous fistula steal syndrome surgery (such as DRIL technique) may potentially lead to the iatrogenic injury of the MACN and its branches as well. Routine venipuncture and percutaneous endovascular procedures from brachial or axillary approach can also cause nerve injury.

Similarly to vascular surgery on the upper arm, plastic surgeons during traditional brachioplasty procedures perform a vast dissection of the upper arm. Longitudinal incision usually runs from the medial epicondyle to the axilla. As there is a possibility of iatrogenic nerve injury, an eventual anatomical variation of the upper extremity nervous system must not be neglected.<sup>[4]</sup>

As the MACN is often used as a "cable graft" in neurosurgical reconstructions, patients undergoing surgery must be aware about possible neurological complications after harvesting.<sup>[5]</sup>

Typical anatomy of MACN and its variations are widely described in the literature. Surgeons dealing with upper extremity surgery should be aware of this unique case of anatomical variation of MACN. Neurologists should as well consider this unusual variation during the postoperative neurological examination of patients who underwent an upper extremity surgery.

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