A cadaveric micro-anatomic study of intra-fascicular topography of brachial plexus

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Introduction-

Functional recovery after nerve lesion and repair depends on number of axons crossing coaptation site. Re-establishment of original axonal connections influenced by connecting related fascicles in proximal and distal stumps.

Hypothesis-

Possibly improved results of nerve grafting/ neurotization by mapping exact anatomical location of fascicles in brachial plexus elements

Objectives-

To map intraneural topography of important motor fascicles within roots of brachial plexus

Rationale of study-

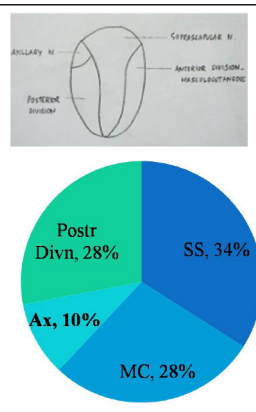
Axonal misrouting common after nerve transfer/ neurotization- influences surgical outcome. Fascicular nerve repairs should produce better results than epineurial repairs. Hence, Kkowledge of fascicular anatomy essential

Methods

Total of 10 fresh adult male cadavers. Right sided brachial plexus dissected. Roots, cords, divisions and branches tagged on most cranial aspect by 10-0 nylon (from surgeon's perspective). Transection of complete plexus from roots to cords along with proximal 1 cm of all branches. Specimens fixed immediately for at least 48 hours. Institute Ethical Clearance taken

Learning Objectives

The knowledge of fascicular topography of brachial plexus is useful and might lead to improved results after nerve repair by anastomosing related fascicles.

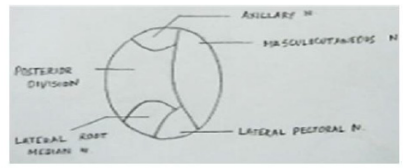


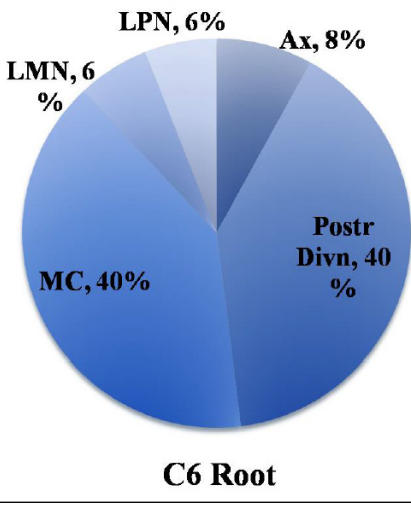
C5 Root

Results

Fascicular topography-

Fascicular branching fortuitous- microdissection possible. Localization of fascicular groups consistent in roots. C6-8- 74% of plexus; C5 and T1- rest. 10% plexus supplies shoulder (Axillary and SS). 13% supplies Masculocutaneous N, 27% supplies the Radial N. 26% supplies the Median N, 14% supplies the Ulnar N





C6 Root

Conclusions

Fascicular branching common, especially in the C8-T1- fascicular microdissection possible Definite anatomical localization of fascicular groups feasible in BP elements Exact fascicular location translatable to the OR- can be used to anastomose related fascicles in plexal surgery Axonal misrouting avoided- Possible improved results of nerve grafting

References

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2. Chen Z et al. Ann Plast Surg. 2011
3. Siqueira MG, et al. Neurosurgery. 2010
4. Sun K, et al. Microsurgery. 2009

Acknowledgements-

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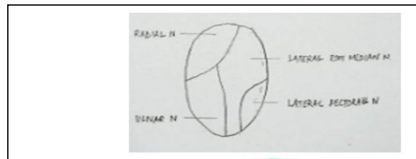
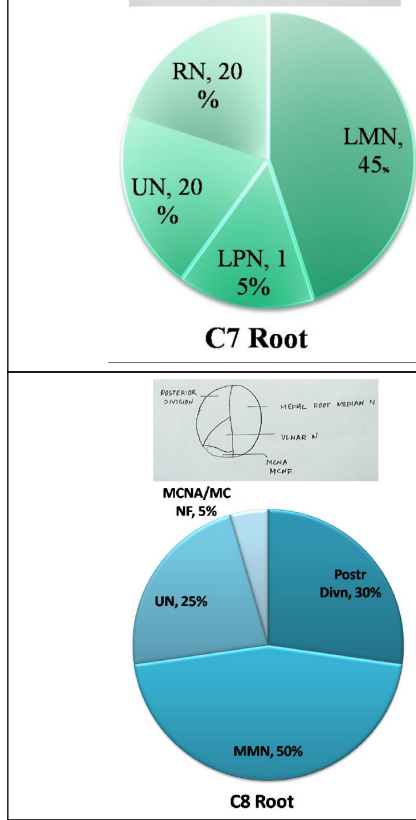
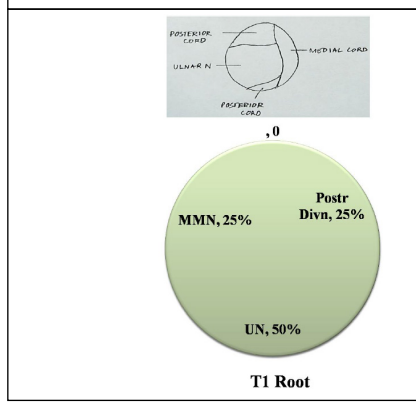
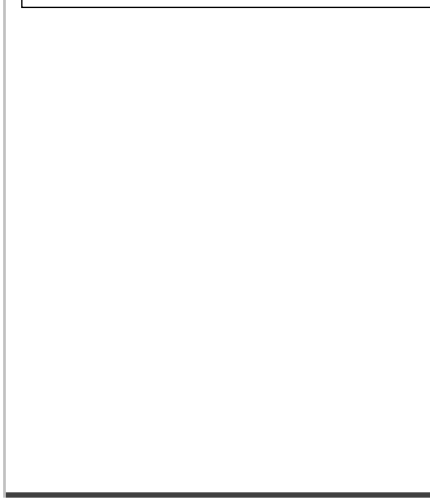




C7 Root



C8 Root



T1 Root