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IDEAS AND INNOVATION

Nerve Coaptation: The Cone and Scoop Technique

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Nerve coaptation has traditionally been performed by suturing. Good alignment banks on suturing based on configuration of fascicular pattern and vasa nervosum. Over the decades, improved suture materials and magnification have aided optimal alignment and improved outcomes. Recent trends of use of fibrin glue is as good as suturing in experienced hands, and superior to sutures when the surgeon is inexperienced[1]. Loss of regenerative axons in sutured nerves has been attributed to tension, skewed alignment or poor wound bed which lead to detrimental results. Mushrooming of cut axonal ends is inherent in anatomy and leads to difficulty in suturing, malalignment and loss of conduction. Tight suturing may also cause nerve ends to protrude out or crumple and misalign[2].

It is generally thought that a minimal amount of suture material is preferable, and the number of sutures should be no greater than the minimum number required to ensure coaptation of the nerve stumps. It is important that the nerve ends are not closed too tightly with tension[3,4]. Surgeons usually trim the axonal sprouts before suture or the protruding bundles after coaptation, while some choose to push back the same within the suture line, with questionable benefits. Outward-pointing fascicles are sometimes found and should be cut with microscissors. They may then be able to retract to within the coaptation and regenerate sufficiently.

We follow a variation of the axonal trimming technique which aids coaptation and avoids fascicular protusion. When two healthy nerve ends are coapted mushroomed fascicles face each other and on approximating some may change direction in centrifugal pattern leading to loss of axons on regeneration. (Fig I) To minimise this loss we prefer to trim the mushroomed fascicles on one end of the nerve by cutting inwards to create a cone. The epineurium is preserved (Fig. 1) The other nerve end is retained as such so that it fits into the cone ,akin to a scoop in a cone.

The concept of coning prior to coaptation ensures good approximation and no loss of axons due to misdirected fascicles. It enables axonal growth at different level avoiding mixing of regeneration axons when aligned properly by epineural repair technique. Coning is very simple to perform using sharp microscissor and takes little additional time. (Fig II) At our centre we have started using this technique recently. It is felt that the sound theoretical basis and

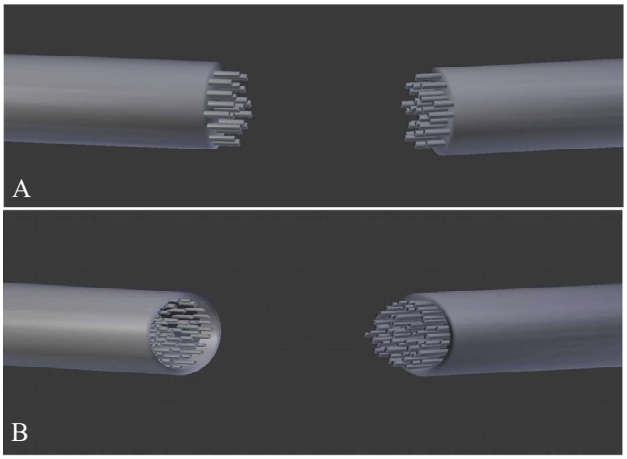

Fig. 1 (a) Mushrooming of cut ends **(b)** Cone and scoop technique

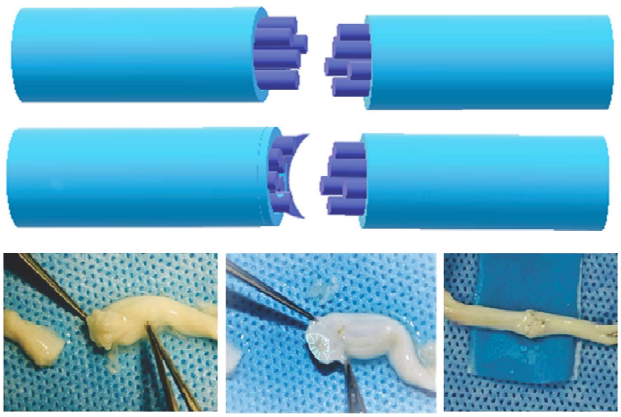

Fig. 2 Nerve showing mushrooming, coning technique and cone and scoop tech of coaptation.

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practised surgical ease supports this concept. A comparative analysis of straight vs cone and scoop technique may yield objective data on benefits and is the subject of a proposed study.

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