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Surgical technique

Endoscopically assisted proximal radial nerve decompression: Surgical technique

Décompression proximale du nerf radial assistée par endoscopie : technique chirurgicale

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ABSTRACT

State of the art. – The proximal radial nerve compression syndrome includes supinator syndrome and proximal radial nerve constrictions. This article presents a new endoscopic assisted radial nerve decompression surgical technique described for the first time by Leclère et al. in 2013.
Surgical technique. – Endoscopic scissor decompression of the proximal radial nerve is always performed under plexus anaesthesia. It includes 8 key steps documented in this article. We review the indications and limitations of the surgical technique.
Conclusion. – Early clinical results after endoscopic assisted decompression of the radial nerve appear excellent. However, they still need to be compared with conventional techniques. Clinical studies are likely to widely develop because of the mini-invasive nature of this new surgical technique.

Mots clés :
Endoscopie
Syndrome supinateur
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RÉSUMÉ

État de l'art. – Le syndrome de compression proximale du nerf radial regroupe le syndrome supinateur et les cas de constrictions. Cet article présente une nouvelle technique chirurgicale de décompression proximale du nerf radial assistée par endoscopie décrite pour la première fois par Leclère et al. en 2013.
Matériel et technique chirurgicaux. – La décompression endoscopique par ciseaux du nerf radial est réalisée dans chaque cas sous anesthésie plexique. Elle comprend 8 étapes clés documentées dans cet article. Nous revenons sur les indications et les limites de la technique chirurgicale.
Conclusion. – Les premiers résultats cliniques après décompression endoscopique du nerf radial dans sa partie proximale sont excellents. Ils doivent encore être comparés à ceux des techniques conventionnelles. Les études cliniques vont probablement se développer largement du fait du caractère mini-invasif de cette technique chirurgicale.

1. Introduction

The proximal radial nerve syndrome includes supinator syndrome and proximal radial nerve constrictions. Radial tunnel syndrome was first reported as a unique clinical syndrome in 1956 by Michele and Krueger [1]. This compression occurs in the proximal forearm where the radial nerve splits into the posterior interosseous nerve and the sensory branch of the radial nerve. Compression can occur either before or after this split. Six sites of potential compression have been underlined:

- the proximal origin of the extensor carpi radialis brevis muscle (ECRB);

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- fibrous bands within the ECRB;
- a thickened fascial tissue superficial to the radiocapiteller joint;
- the radial recurrent vessels or leash of Henry;
- the arcade of Frohse (proximal border of the supinator muscle), and;
- the distal border of the supinator muscle.

Non-operative management is always prescribed initially and consists of rest and a tapered course of oral corticosteroids. When symptoms persist, an open surgical treatment is necessary to release the nerve compression sites. Since the first work of Tsai [2], endoscopically assisted decompression of peripheral nerves at the upper extremity has steadily developed and represents a reliable and reproducible alternative to conventional surgical technique for ulnar nerve [3–14] and median nerve compression [15–17]. After an initial assessment of the endoscopic assisted technique for decompression of the proximal radial nerve (unpublished data), we have successfully published our first clinical applications [15]. Herein:

- we present the key steps of the endoscopically assisted proximal radial nerve decompression;
- the discussion underlines the many benefits of this minimally invasive technique;
- it presents the limits of the endoscopic nerve decompression and also the prospects for future development.

2. Material and surgical technique

2.1. Step one: the material

The material includes a 4 mm 30° endoscope (Karl Storz, Tuttlingen, Germany) (Fig. 1), a speculum with light attachment, a bipolar cautery, Metzenbaum scissors and Duplay dressing forceps.

Fig. 1. Endoscope used for decompression of the proximal radial nerve.
Endoscope utilisé pour la décompression proximale du nerf radial.

2.2. Step two: anaesthesia

Endoscopically assisted proximal radial nerve decompression is performed under plexus anaesthesia, where necessary under general anaesthesia with a sterile tourniquet applied.

2.3. Step three: installation of the patient

The checklist must be performed carefully. Special attention is given to the material, and the side of the decompression. The correct positioning of the patient is important for a successful operation. To simplify access for the surgeon, the hand table should be as high as possible. This allows a better view of the operative site. The involved arm is slightly flexed in the elbow and held in neutral or slight pronated position.

2.4. Step four: marking the first incision

A 2- to 3-cm incision is made no more than 5 cm proximal to the elbow joint following the line from the insertion of the deltoid to the

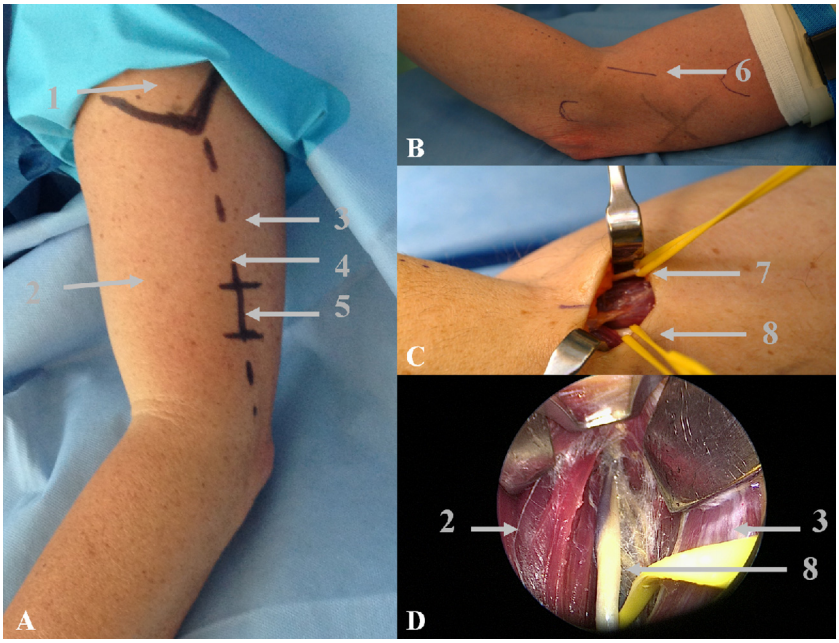

Fig. 2. Drawing of the first skin incision for the proximal decompression of the radial Nerve. B,C,D: In obese or very muscular patients: incision 4 cm proximally slightly anterior between the brachioradial and triceps muscles (1: deltoid muscle; 2: biceps muscle; 3: triceps brachii muscle (lateral head); 4: lateral intermuscular septum; 5: first skin incision; 6: first skin incision slightly anterior in obese patients; 7: musculocutaneous nerve; 8: radial nerve between brachioradial and triceps muscle).
Schéma de la première incision cutanée pour la décompression proximale du nerf radial ; B,C,D: Pour les patients obèses ou présentant une masse musculaire importante : incision à environ 4 cm du pli du coude et plus antérieure entre les muscles triceps brachial et brachioradial (1 : deltoïde ; 2 : biceps brachial ; 3 : triceps brachial (vaste latéral) ; 4 : septum intermusculaire latéral ; 5 : première incision cutanée ; 6 : première incision cutanée plus antérieure pour les patients obèses ; 7 : nerf musculo-cutané ; 8 : nerf radial entre les muscles triceps brachial et brachioradial).