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IDEAS AND INNOVATIONS

Hand/Peripheral Nerve

Wide-awake Anesthesia No Tourniquet Trapeziometacarpal Joint Prosthesis Implantation

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Summary: Wide awake local anesthesia no tourniquet (WALANT) hand surgery is a rapidly growing in popularity. WALANT has been used by hand surgeons when operating on bones, tendons, ligaments, nerve entrapments. We offer a case report of the first case in the literature describing WALANT technique when performing trapeziometacarpal joint arthroplasty with prosthesis implantation. We offer technical points on how to perform this procedure and the advantages that are associated with using WALANT for prosthesis arthroplasty. *(Plast Reconstr Surg Glob Open 2018;6:e1714; doi: 10.1097/GOX.0000000000001714; Published online 4 April 2018.)*

INTRODUCTION

Wide awake local anesthetic no tourniquet (WALANT) hand surgery or "wide-awake" hand surgery is growing in popularity globally.[1] Lidocaine with epinephrine local anesthetic is frequently used without concern in the hand and finger.[2] Initially, the technique was described for small procedures such as trigger finger release and carpal tunnel release; however, the spectrum of hand procedures offered using solely local anesthesia is fast growing.[3] Hand surgeons utilize WALANT for finger fractures,[4,5] flexor tendon repairs,[6] tendon transfers,[6,7] arthroscopies, and open triangular fibrocartilage complex (TFCC) repair.[8] Trapeziectomy for trapeziometacarpal (TMC) joint arthritis has been described using wide awake hand surgery, which involves numbing the joint itself.[9]

TMC joint prosthesis implantation was first described in 1973, by de la Caffinière.[10] This procedure is typically conducted under general anesthesia or brachial plexus bloc. We describe the use of WALANT for a TMC joint prosthesis implantation.

CASE REPORT

A 56-year-old otherwise healthy janitor with long-lasting TMC joint arthritis presented to our office after exhausting conservative management options. The patient's key-pinch was reduced to 3 kg compared with 6 kg on the opposite side. Front and lateral x-rays of the trapeziometacarpal joint showed: osteoarthritis Eaton II[11] and Dell II[12] with an articular pinch. No dorsal subluxation was observed. DELL's stage 1 corresponds to slight narrowing of joint and subchondral sclerosis; stage 2 to a moderate narrowing and sclerosis, with slight subluxation of first metacarpal (less than one-third diameter) and small osteophyte, whereas in stage 3, there is important narrowing, sclerosis, and osteophytosis, with subluxation of the first metacarpal. A total disappearance of joint, flattening of trapezium, and peritrapezial osteoarthritis corresponds to a stage 4.

We prepared the local anesthetic injection mixture according as follows: 100 ml mixture of 40 ml of normal saline solution, 40 ml of 1% lidocaine with 1:100,000 epinephrine, 4 ml of sodium bicarbonate, and 10 ml of 0.5% bupivacaine. The bupivacaine was added to prolong the postoperative antalgic action. The patient was in supine position. We adapted the infiltration technique described by Lalonde[13] for trapeziectomy. We used a 50 mm long 25-gauge needle to inject 20 ml dorsoproximal to the TMC joint in a subcutaneous fashion (1) (Fig. 1). Then we infiltrated another 20 ml dorso-distal to the TMC joint (2). Another 10 ml was injected radial to the joint and 10 ml ulnar to the joint (3) (4). Ten milliliters of local anesthetic was infiltrated volar to the joint (5), and another 10 ml was infiltrated between the first and second metacarpal (6) (Fig. 1). Lastly, during the operation, we distracted the TMC joint and infiltrated 5 ml in the joint itself. The terminal branches of the radial and median nerves[14] must be

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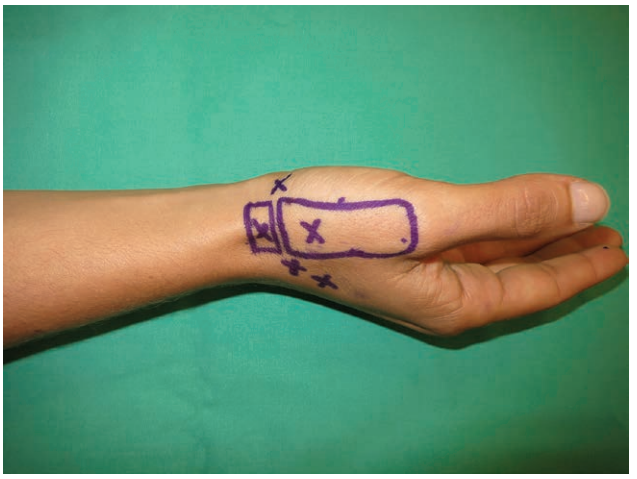

Fig. 1. Points of injection: we inject 20 ml dorso-proximal and 20 ml dorso-distal to the TMC joint in a subcutaneous fashion. Further 10 ml was injected radial to the joint and 10 ml ulnar to the joint. Ten milliliters of local anesthetic was infiltrated volar to the joint, and another 10 ml was infiltrated between the first and second metacarpal. Lastly, during the operation, we distracted the TMC joint and infiltrated 5 ml in the joint itself.

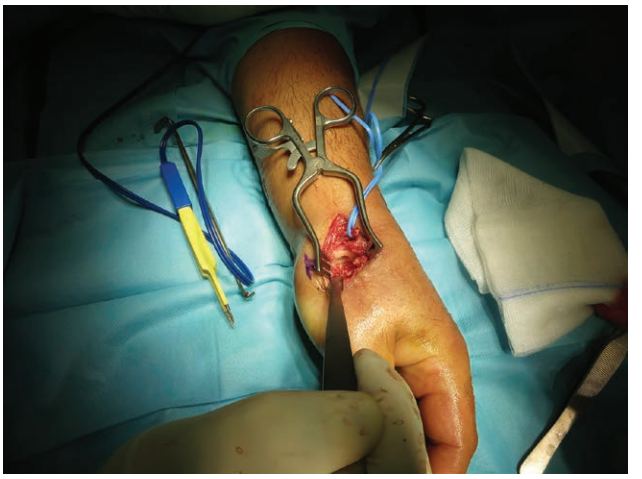

Fig. 2. Intraoperative picture: No tourniquet was applied. After grinding and shaping of the socket, minimal bleeding was observed.

numbed with the locally injected anesthesia.[15] We waited at least 26 minutes between injection and skin incision as proposed by McKee et al.[16]

The placement of the IVORY prosthesis through a dorsal approach was performed in a standard fashion without pain for the patient. A dorsoradial incision was performed to approach the TMC joint. After identifying and protecting the superficial branches of the radial nerve, the slips of the abductor pollicis longus muscle were retracted and preserved. A longitudinal arthrotomy of the TMC joint was performed, preserving capsule for closure.[17] With an oscillating saw, a thin slice of the distal trapezium, enough to get a flat surface, and proximal metacarpal joint surface were excised. A tourniquet was not necessary, and visualization was excellent even when grinding and shaping of the socket in the trapezium (Fig. 2). After placement of the sizer prosthesis, we tested the fit, and the range of motion of the joint. The Kapandji test for thumb mobility was performed.[18] The Kapandji score assesses the opposition of the thumb, based on where on their hand the patient is able to touch with the tip of their thumb. A score 1 means their thumb touches the radial side of the proximal phalanx of the index finger, and a score then means that the patient can touch the distal palmar crease at the fifth metacarpal. Intraoperatively the patient scored 5 of 10 and complete thumb extension. Circumduction of the thumb was possible, and the TMC joint was stable in all active and passive positions. Active key-pinch was tested and found to be stable. The sizer was stable when tested passively and actively. Intraoperative testing assisted in selecting the proper prosthesis size for the patient. The patient was also very interested to see how his thumb moved after the prosthesis was placed and before any pain and swelling set in. The postoperative care consisted in 2 weeks of splinting.

In follow-up, the patient reported only minimal discomfort for a couple of days after the surgery, managed solely with Ibuprofen and Acetaminophen and Tramadol. At 6 month postoperatively, the patient's functional testing showed complete extension of the thumb and a Kapandji score of 9 of 10 bilaterally. The postoperative x-rays were satisfying (Fig. 3), and no complications were observed in follow-up.

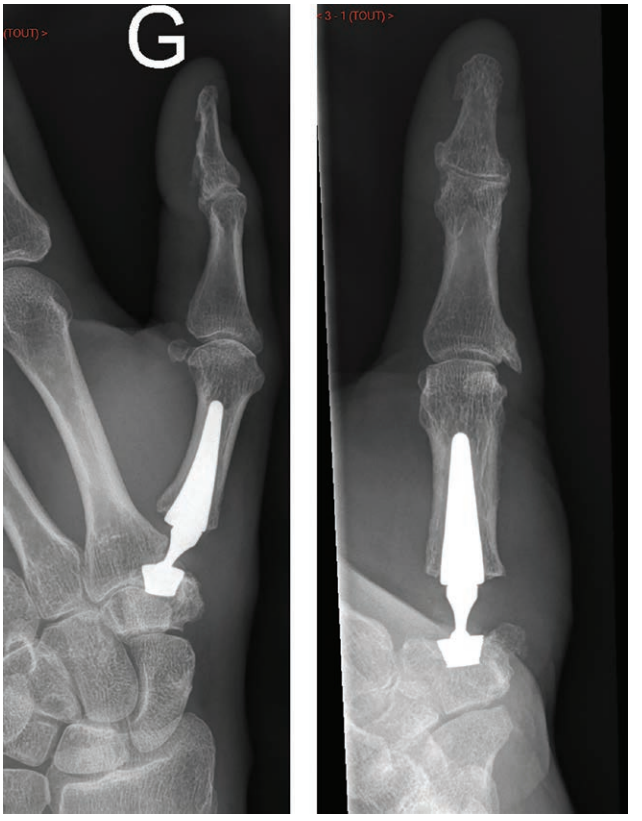

Fig. 3. A, Postoperative lateral view after 6 months. B, Postoperative anteroposterior view after 6 months.

Video Graphic 1. See video, Supplemental Digital Content 1, which displays intraoperative testing of the trapeziometacarpal prosthesis and the 10 reasons why hand surgeons should do this procedure in local anesthesia, ***http://links.lww.com/PRSGO/A694***.

CONCLUSIONS

The 10 reasons why hand surgeons should do this procedure in local anesthesia (**see** video, Supplemental Digital Content 1, which displays intraoperative testing of the trapeziometacarpal prosthesis and the 10 reasons why hand surgeons should do this procedure in local anesthesia, ***http://links.lww.com/PRSGO/A694***):

1. No pain due to a tourniquet[3]
2. Minimized anesthetic risk[1]
3. Maximized cost-effectiveness[3] and
4. Decrease inhouse time.
5. Blood less surgical field due to epinephrine[19]
6. Intraoperative testing of the active and passive stability of the prosthesis, limited active stability would change the decision of the size of the prosthesis or the placement of the pieces of the prosthesis or the type of intervention.
7. Local anesthesia can be prolonged with a catheter during postoperative course for further pain release.
8. The patient can observe his active range of motion during the operation; this could motivate him for later reeducation.
9. The active mobility and the joint access could be used for clinical research to measure intraarticular pressure and force during active movements; may be this could help to predict disintegration of the joint.
10. The active mobility could be saved on video and could be used for patient education and for medicolegal purpose.

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