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ORIGINAL STUDY

Fascial flap surgery for recurrent dorsal ganglion

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Recurrence after primary resection of a dorsal wrist ganglion may necessitate a reintervention. A technique was introduced in 2004 in which a flap of the extensor retinaculum is used to cover the defect left in the wrist capsule following repeat radical excision. This retrospective study presents the follow-up 4.6 years after this surgery in 20 patients. Recurrence, grip strength and possible flexion deficit are measured in 13 patients who attended clinic, as well as pain and satisfaction scores. Disability scores have been evaluated in 18 patients. One refractory patient was ascertained. A flexion deficit ≤ 10° was observed in 7 patients. Overall, mild pain, very mild disability, a flexion deficit of 14.2° and a loss of grip strength of 3.6 kg was observed. The retinaculum flap for recurrent dorsal wrist ganglion is a reliable procedure with limited risk for flexion deficit after surgery, high satisfaction rate and low recurrence risk.

Keywords : ganglion cysts, dorsal ganglion, extensor retinaculum, fascial flap, retinaculum flap, recurrence.

INTRODUCTION

The most common benign soft tissue tumor in the wrist is the dorsal ganglion representing 70% of all wrist ganglia, usually seen in patients between 25 and 40 years old (*11*). Usually, a pedicle communication is seen with the radiocarpal joint at the scapholunate interval and the ganglion is filled with joint synovial fluid, manifesting as a subcutaneous swelling which may result in wrist pain. A one-way valve mechanism by which the fluid travels from the wrist into the ganglion has been described, with accumulative inflation of the cyst (*1,14*). Most ganglion cysts do not require treatment if asymptomatic and resolve spontaneously over time. However, if the cyst is painful, interferes with function or has an unacceptable appearance, there are several treatment options available.

Ganglionectomy may be recommended if the symptoms are not relieved by nonsurgical methods. However, recurrence after surgery is not unusual and reintervention may be necessary (*9*). A different approach may be considered with the intention to decrease recurrence risk. In 2004, Citron et al. introduced a technique in which a flap of the extensor retinaculum is used to cover the defect left in the wrist capsule following repeat radical excision of the recurrent ganglion (*3*). He presented promising results without recurrences in a series of 8 patients, but a remaining flexion deficit in the wrist can be a consequence of the procedure. No further literature on outcome was found. We introduced this technique at our department ever since in selected cases.

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Here we present the medium term follow-up of patients in a similar series of patients as first presented by Citron et al. and evaluated their clinical outcome.

MATERIALS AND METHODS

Twenty patients underwent this fascial flap surgery since its introduction in 2005 until 2014 and were invited to participate in this study. They were invited by phone or by mail to attend clinic for a clinical outcome assessment. The study was approved by the ethical committee of the University Hospitals of Leuven. In response to the invitation, 13 patients were examined in clinic. In addition, 5 patients who were unable to attend clinical examination were interviewed over the phone. Two patients were lost to follow-up.

The final patient file thus consisted of 18 patients with an average age of 34.4 years (SD ± 12.1 ; range 16.3-54.6) of which 3 men and 15 women. Previous to the fascial flap surgery, 15 patients underwent one and 3 patients underwent two previous surgical attempts. The delay between the last surgery and the retinaculum flap surgery ranged from 4 months to 16 years (self-declared by the patients). The average length of follow-up after the retinaculum flap surgery was 4.6 years (SD ±2.6 ; range 0.9-9.6).

The retinaculum flap surgery was performed based on the description of Citron et al. The dorsal incision is reopened, usually in a horizontal plane. The extensor retinaculum is dissected and a ulnar based distal flap of 1 centimeter diameter and 2 cm length is prepared. The flap is based on the intercompartmental 2,3 supraretinacular artery or its branches. These arteries are not dissected, the flap is based on the retinaculum including its supraretinacular branches. Then, the ganglion is isolated and the pedicle is followed until the joint (the scapholunate interval) and excised completely. The retinaculum flap is than tunneled under the extensor tendons and the capsular defect is covered with the distal end of the retinaculum flap and fixed in the capsular defect. The skin is closed and the wrist is immobilized for three weeks. After this, full range of motion exercises are allowed and full weight lifting and daily living can be restored within 6 to 10 weeks, according to functional recovery.

Ganglion recurrence was evaluated by clinical examination. The range of motion of the wrist was measured with a goniometer and compared to the contralateral wrist, with attention to a possible residual flexion deficit as suggested by Citron et al.

The secondary objectives of the study are an evaluation of the residual pain, satisfaction and disability. Pain was assessed with a 10 point rated Visual Analogue Scale for Pain (VASP ; range 0-10), satisfaction with a similar Visual Analogue Scale for Satisfaction (VASS ; range 0-10) and the disability with the Disabilities of Arm Shoulder and Hand score (DASH ; range 0-100). A quick-DASH score was taken over the phone in 5 patients who were unable to attend clinical examination (*10*). Secondly, grip strength was measured with a Jamar® dynamometer and compared with the contralateral hand.

RESULTS

Recurrence occurred in 1 of 18 patients 2 years after the retinaculum flap surgery. Persistent loss of flexion was seen in 13 patients with a mean flexion deficit of 14.2° in comparison with the contralateral wrist. In 6 out of 13 patients, a flexion deficit of more than 10° was found.

Mean VASP in 13 patients was 2.1 (range 0-9). This is classified as mild pain (0.4-4) (*6*). The mean satisfaction VASS was 8.3 (range 2-10). Mean DASH score was 14,0 (range 0-52.2) following data in 13 patients in this study and the mean QuickDASH score was 15,4 (range 2.3-43.2) based on 5 patients. A clinician-rated and self-rated severity scale classifies this as “very mild” disability (*7*).

The mean grip strength in the operated hand was 21.7 kg (range 5-31 kg), 3.6 kg less than the contralateral hand, with a mean strength of 25.3 kg (range 11-36 kg) based on the 13 patients who attended clinical exam.

DISCUSSION

In the original study of Citron, none of 8 patients had recurrence after 28 months. In this study, 1 of

18 patients had recurrence after a mean follow-up of 4.6 years. This therapy refractory patient chose to undergo no further treatment. The reason for recurrence in this patient is unknown.

Citron et al. postulated the possibility of prolonged recovery time after surgery. Persistence is required on the part of the surgeon, hand therapist and patient until the wrist regains full function. This study presents the outcome 4.6 years after the surgery and full recovery without flexion lack (defined as a deficit less than or equal to 10° compared to contralateral) was observed in 7 patients (54%). Overall, mild pain, very mild disability, a flexion deficit of 14.2° and a loss of grip strength of 3.6 kg was observed.

The high inclusive rate of the study (100%) is a positive element, as all patients that ever had surgery since the introduction of the surgical procedure in Leuven have been included. Moreover, patient follow-up, including the in this article described medium-term follow-up, has been very consequent (at least one follow-up consultation within 6 months after surgery for all patients except one).

After 4.6 years however, 13 out of 20 patients attended clinical examination ; two patients were lost to follow-up and 5 completed only the written questionnaire. The self-declared reasons for the latter not attending clinical examination were their too busy work obligations and an absence of symptoms (a very good DASH outcome). Two patients were lost to follow-up.

For primary ganglion cysts, surgery options are open surgery, first described in 1976 by Angelides, as well as an arthroscopic intervention, which was developed later by Osterman and Raphael in 1995 (*2,12*) Open surgery is best performed by involving excision of the entire ganglion complex, including the cyst and the involved joint capsule or tendon sheath, which is considered the root of the ganglion (*5,11*). Complications of open surgery include infection, neuroma, unsightly scar and keloid. Stiffness was reported in 25% of patients and required up to 8 weeks of occupational therapy to regain maximum function (*11,13*). Artroscopic resection decreases the amount of blunt dissection and potential scarring in comparison with open surgery. This approach should also significantly increase function and significantly decrease pain within 6 weeks after the procedure (*4,11*). Many studies compared the difference in recurrence between open surgery and arthroscopic treatment. Recurrence after arthroscopic treatment (0-10%) is often described as lower than after open surgery (results variating between 8-40%), but these observations usually have selection bias, small cohorts and a poorly described follow-up and thus the recurrence rate may not be an argument in choosing between these techniques. This is based on the Kang et al. study that describes the difference in recurrence after 12 months as almost equal (9% in open group versus 11% in artroscopic group) (*9*).

Many patients who have a postoperative recurrence choose no second operation. Wright et al operated on only 29% of recurrences and Jacobs and Govaerts reported only 5 of their 20 patients to have enough symptoms from it to warrant a second operation (*8,11,16*). One study has analyzed the patient's perception about ganglia. This reveals that most patients are concerned about cosmetics (38%), more than the concern for malignancy (28%) or pain (26%) (*15*). Also no recurrence risk has been described so far after a second artroscopic resection or any other treatment.

CONCLUSION

The retinaculum flap for recurrent dorsal wrist ganglion is a reliable procedure with limited risk for flexion deficit after surgery, high satisfaction rate and low recurrence risk.

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