

Surgical Management of Dorsal Wrist Ganglions: A Comparative Study Between Two Surgical Modalities.

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ABSTRACT:

BACKGROUND:

Ganglions are the most common benign cystic swellings found around the wrist, they can be treated conservatively or by different surgical techniques. Our surgical modality (excision of ganglion complex with fat graft) has given encouraging results.

OBJECTIVE:

To compare the efficacy of excising dorsal wrist ganglions and fat graft and excision alone .

PATIENTS AND METHODS:

A prospective study was conducted on patients with dorsal wrist ganglions. Surgical procedure in 25 cases was excision of the cysts and its neck , while for the rest 25 cases, excision of the cysts followed by fat graft, then an immobilization for 7-10 days.12-18 months period of follow-up was adopted for detection any recurrence.

RESULTS:

Most of the patients were females. Most of the patients presented mainly because of cosmetic reasons. Recurrence was the most frequent complication encountered and involved 16 % in those of group A and only 4% in those of group B.

CONCLUSION:

The technique of excision of dorsal wrist ganglions and fat graft is simple and effective.

KEY WORDS: dorsal wrist ganglions. surgical management of ganglion. fat graft.

INTRODUCTION:

Ganglions are the most common soft-tissue mass presenting in the hand and wrist, accounting for 50% to 70% of all masses in this anatomic region⁽¹⁾. They consist of mucin-filled cyst connected to a tendon, tendon sheath, or joint capsule⁽²⁾ and they may also present as intra tendinous or intraosseous⁽³⁾. They can occur at all ages but are most prevalent during the second, third, and fourth decades of life. Women are affected 3 times as often as are men⁽⁴⁾.

The majority of ganglions (60-70%) are found on the dorsum of the wrist over the scapholunate interval⁽⁵⁾. The etiology of is unknown. Although some patients recall a specific traumatic event, the vast majority do not. The diagnosis is often made on the basis of the history and physical examination^(6,7). Treatment options have many varieties and each option yields different success results⁽⁸⁾ Other than observation, nonoperative treatment such as closed rupture, ganglion puncture, and needle

aspiration is associated with relatively higher rates of recurrence as high as 78%^(9,10,11). Surgical excision either open or arthroscopic has been reported to have the best success rates in terms of recurrence^(3,12,13). However, infections, scars, neuromas, joint stiffness and decreased grip strength can complicate surgery⁽¹⁴⁾.

The purpose of this study was to prospectively compare the rates of recurrence and the other complications between the traditional surgical method and our modified modality.

PATIENTS AND METHODS:

A prospective study was conducted on patients with dorsal wrist ganglions from January 2007 to January 2011. A total of 50 patients were recruited in this study, they were arranged randomly into two groups: group(A) who treated by excision of the cyst alone(traditional way) as a control group and group(B) who treated by the (modified way), excision and fat graft, 25 patients for each group. Full medical and surgical history was taken beside proper hand examination and detailed explanation of the adopted technique to the patients.

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Technique:

All the patients were operated upon under general anaesthesia using pneumatic tourniquet to ensure a bloodless field. Dorsal ganglion cysts were approached through a transverse incision centered directly over the ganglion cyst. Extensile skin incisions were rarely necessary because the dorsal skin is freely mobile. The extensor tendons that run across the back of the wrist were retracted out of the way. The main cyst was mobilized from the surrounding tissues and followed down to where it attaches to the extensor tendon sheath or wrist capsule, then the entire ganglion and its stalk were excised. A small portion of joint capsule through which the ganglion may arise was also excised. For those patients in group (B), a small piece of fat was harvested from the subcutaneous fat near the ganglion and used as a plug obliterating the space left by ganglion removal and fixed in place using absorbable sutures. Finally, the tourniquet was deflated and hemostasis secured. The skin incision was sutured shut using non absorbable sutures that

were removed after 10 days. The wrist is also immobilized by splints in a slight dorsiflexion for 7-10 days. Injectable cephalosporin's for 5-7 days as a prophylaxis against infection were prescribed beside non steroidal anti-inflammatory drugs as a pain control medication was used on need.

The patients were scheduled back for follow up once weekly for the first month and then monthly for 12-18 months. In each visit, the patients were asked about pain and any other abnormal symptoms, beside palpating the dorsal wrist in flexed posture to detect any recurrent mass.

RESULTS:

Out of total 50 patients, 32 were females and 18 were males, showing female preponderance. The patients presented in the second and third decades of their ages, with highest incidence noted in the second decade (40 patients). The dominant hands were involved more (36 patients) than the non-dominant one (14 patients). Regarding the patients perception on presentation, table 1 demonstrates the differences.

Table 1. Perception of patients on presentations.

perception	No.	%
Cosmetic	30	60
Fear of malignancy	12	24
Pain	8	16

None of the patients had undergone any previous conservative treatment or surgery before. Fifteen patients gave a history of trauma on the involved

wrist before the appearance of ganglions. Table 2 demonstrates the complications encountered in both techniques.

Table 2: Post-treatment complications.

Complications	Surgical treatment			
	Group A		Group B	
	No.	%	No.	%
Recurrence	4	16	1	4
Painful scar	2	8	1	4
Weak grip	2	8	-	-

DISCUSSION :

Carpal ganglions are the commonest soft tissue swellings around the wrist. In this study all the patients presented in the second and third decades of life and most of them were females (64%). This is comparable with the epidemiological data of wrist ganglions⁽¹⁵⁾. Many investigators theorize that a history of repeated minor trauma is a predisposing factor in their development^(6,10,11).

This statement can explain the etiology in (30%) of our patients who gave a history of a preceding traumatic event of the involved wrist; however, the exact cause of ganglions remains uncertain⁽⁷⁾. Regarding the perception of ganglions as a disease; most of the patients presented for cosmetic reasons (60%) and to lesser extent for being concerned about malignancy (12%). Other patients sought

help because of pain (8%). These results are comparable with that of Westbrook⁽¹⁴⁾ who reported that most of the patients expressed cosmetic concerns. This supports the conclusions of other authors that pain, no matter how commonly present, is rarely impairs the activity and is not usually the cause for seeking medical care^(16,17,18).

In this study, the recurrence rate was (16%) in those patients treated by the traditional excision of the ganglion while it was (4%) in those treated by excision and fat graft. As an explanation for this reduction in the recurrence rate we assume that the fat graft is acting as a plug obliterating the dead space (even if part of it becomes resorbed) preventing pumping the synovial fluid back into the cyst.

Prior to the work of Angelides⁽⁹⁾, the post operative recurrence rates were as high as 40% but since the adoption of radical surgical technique that includes excision of the entire ganglion complex and a wide cuff of the adjacent joint capsule, the recurrence rates have improved significantly. Hence, Varly⁽²⁰⁾ had a recurrence rate of (27%) and Clay⁽¹³⁾ had an only (3%) recurrence rate. However, this radical procedure had its own complications: persistent pain which may be the result of damage to cutaneous nerves in the area or the development of reflex sympathetic dystrophy, Scapholunate dissociation, joint stiffness, decreased grip strength, neuroma and unsightly depressed scar have all been reported^(18,21). The results of recurrence in our technique are comparable with these results, but we have no other serious complications apart from painful scars in (4%) of the patients.

Weak grip were found in 8% of group A, while, it is nil in group B, this may be attributed to that the fat will provide a cushion for the tendons to glide and for the resultant dead space just above the capsule of the joint to heal with minimum fibrosis. Painful scar were found to be less in group B (4%) than group A (8%), that may be attributed to the isolation effect of the fat, between the injured cutaneous nerve endings and the scar, preventing entrapment of the nerve endings in the resultant scar.

So we can state that; excising the ganglion complex with a small adjacent area around its neck, rather than a wide area of joint capsule, in conjunction with fat graft is superior to radical surgical technique because the associated complications are less.

Arthroscopic resection also provides low recurrence rate. Ho et al⁽²²⁾ used this technique for

dorsal wrist ganglions with a recurrence rate of 26%. Luchetti⁽²³⁾ reported a recurrence rate of 7%. However; this needs sophisticated facilities and an expert surgeon that is difficult to be available all the time.

So we can consider our technique as a good alternative method which has the advantages of simplicity and low rates of complications. However, further histological and ultrasound or MRI studies in addition to a more prolonged period of follow-up are recommended to confirm that.

CONCLUSION:

Ganglions commonly involve patients in the second and third decades of life. Females are more commonly involved. Cosmetic reasons and being anxious about malignancy are the commonest causes of presentation. Fat graft used to obliterate the space after removal of the cyst is simple and provides low rates of complications in comparison with that of radical surgical method.

REFERENCES:

1. Angelides AC. Ganglions of the hand and wrist. In: Green DP, ed. Operative hand surgery. 3rd ed. New York: Churchill Livingstone, 1993:2171-83.
2. Nahara ME, Bucchieri JS. Ganglion cysts and other tumour related conditions of the hand and wrist, *Hand Clin.* 2004;20:249-60.
3. Thournburg LE, Ganglions of hand and wrist, *J Am Acad Orthop Surg.* 1999;7:231-38.
4. Barnes WE, Larson RD, Posch JL. Review of ganglia of the hand and wrist with analysis of surgical treatment. *Plast Reconstr Surg* 1964;34:570-78.
5. Sanders WE. The occult dorsal carpal ganglion. *J Hand Surg (Br)* 1985; 10: 257-60.
6. Lacy E, Thornburg. Ganglions of the Hand and Wrist. *J Am Acad Orthop Surg* 1999;7:231-38.
7. Shapiro PS, Seitz WH. Non-neoplastic tumours of the hand and upper extremity. *Hand Clinics* 1995;11:133-60.
8. Noppachrt L, Vajara W. Randomized controlled trial between surgery and aspiration combined with methylprednisolone acetate injection plus wrist immobilization in the treatment of dorsal carpal ganglion. *J M Assoc Thai*, 2004;87:1513.
9. Richman JA, Gelberman RH, Engber WD, Salamon PB, Bean DJ. Ganglions of the wrist and digits: results of treatment by aspiration and cyst wall puncture. *J Hand Surg* 1987;12A:1041-43.

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10. Stephen AB, Lyons AR, Davis TR. A prospective study of two conservative treatments for ganglia of the wrist. *J Hand Surg* 1999;24B:104–5.
11. Zubowicz VN, Ishii CH. Management of ganglion cysts of the hand by simple aspiration. *J Hand Surg* 1987;12A:618–20.
12. Angelides AC, Wallace PF. The dorsal ganglion of the wrist : Its pathogenesis, gross and microscopic anatomy and surgical treatment. *J Hand Surg* 1976 ;1:228-35.
13. Clay NR, Clement DA. The treatment of dorsal wrist ganglia by radical excision. *J Hand Surg* 1988;13B:187–91.
14. Rocchi L and Canal R. Results and complications in dorsal and volar wrist ganglia arthroscopic resection. *Hand surg* 2006;11:21-26.
15. Minotti P, Taras JS. Ganglion cysts of the wrist. *J American society for surgery of Hand*, 2002;2:102-7.
16. Jacobs L, Govers K. The volar wrist ganglions just a simple cyst? *J Hand Surgery*, 1990;15:342-46.
17. Write T, Cooney W, Ilstup M. Anterior wrist ganglion. *J Hand Surgery*, 1994;19:954.
18. Paul AS, Sochart DH. Improving the results of ganglion aspiration by the use of hyaluronidase. *J Hand Surg* 1997;22-B:219-221.
19. Angelides AC. Ganglions of the hand and wrist. In: Green DP, Operative hand surgery. 2nd Ed. New York: Chirchill Livingstone, 1998:2281-99.
20. Varly GW, Needoff M, Davis T. Conservative management of wrist ganglions. *J Hand Surg [Br]*, 1997;22:636-7.
21. Thournburg LE. Ganglions of hand and wrist. *J AM Acad Orthop Surg*. 2009;7:231-38.
22. Ho PC, Griffiths J. Current treatment of ganglion of the wrist. *Hand Surgery* 2010;6:49-58.
23. Lucchetti R, Badia A. Arthroscopic resection of dorsal wrist ganglion and treatment of recurrences. *J Hand Surgery* 2009;25-B:38-40.