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Outcome of various incisions in the management of De-Quervain disease

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Abstract

Introduction: De-Quervain disease is a stenosing tenosynovitis due to inadequacy volume between abductor pollicis longus, extensor pollicis brevis and their tunnel. Treatment method includes immobilization, steroid injections and operation. For the first time Fritz De Quervain described surgical treatment of this disease. Since then various ways of treatment have been reported.

Aim and Objective: The aim of this study was to evaluate the clinical outcome of various incisions in the management of De-Quervain disease.

Materials and Methods: In this study a total of 45 patients with De Quervain's tenosynovitis confirmed by clinical examination, USG and with pain interfering with daily activities of life were taken.

Results: Mean VAS score in the longitudinal incision group reduced from 9.33 ± 0.617 (range 8-10) to 1.27 ± 0.458 (range 1-2), in the transverse incision group from 9.53 ± 0.640 (range 8-10) to 1.73 ± 0.704 (range 1-3) and in the oblique incision group from 9.40 ± 0.737 (range 8-10) to 1.60 ± 0.828 (range 1-3). The P-value for all this data shows significant reduction from 0.734 (pre-operative) to 0.167 (post-operative). The prevalence of nerve damage in longitudinal incision group was 0.0% while as it was 13.3% in both transverse and oblique groups with a P-value of 0.334.

Conclusion: Compared to the other two incisions, the longitudinal incision is a safe and simple procedure because it makes it simple to identify compartment variations, superficial radial nerve branches, the cephalic vein, and it prevents palmar tendon subluxation by releasing the compartment sheath more dorsally.

Keywords: De-Quervain disease, surgical treatment, longitudinal incision, transverse incision, oblique incision

Introduction

Stenosing tenosynovitis of the Abductor pollicis longus and extensor pollicis brevis of the first extensor compartment of the wrist is referred to as De-quervain's Disease. This problem is more common in those who do a skilled job that requires an extended thumb or the wrist in ulnar deviation like in housewives. The severely incapacitating handicap brought on by this illness limits everyday activities. In 1895, a Swiss surgeon named Fritz de Quervain originally described it at Kocher's Clinic in Berne, Switzerland^[1]. He described this condition in 5 cases of which all were female patients. In recent days, the condition was found to represent thickening of tendon sheath rather than tendinitis owing to lack of histopathological evidence of any inflammation in specimens.

The medical illness known as De Quervain's disease, sometimes known as gamer's thumb or mother's thumb, affects the wrist frequently. De Quervain's disease is thought to be caused by thickening of the synovial sheath surrounding the extensor pollicis brevis (EPB) and abductor pollicis longus (APL) tendons, which causes pain and swelling over the radial side of the wrist in patients as well as an increased difficulty in gripping objects, though the exact mechanism is unknown^[2]. Bunnell comments^[2], "Without the thumb, a hand is little more than a hook" is well known. Functional restrictions are more common in a classical case of de Quervain illness than total functional loss of the thumb.

The pathophysiology of this illness is not addressed by any of the conservative and minimally invasive therapeutic techniques, such as physiotherapy, splinting, or corticosteroid injections. Fibrosis of the affected tendon sheath might develop or remain stagnant.

Conservative treatment never causes the fibrotic process to regress or to go away. However, prolonged mobility of the stenosed tendon sheath causes progressive growth of fibrous tissue and scarring, which worsens the problem.

Thus, the only method to treat the underlying condition, stop its development, and relieve patients of their symptoms is by surgical release of the tendons from the sheath. The majority of patients who need surgery have undergone one kind of conservative care or the other, such as physical therapy, splinting, or plaster casting. Until the patient requests a change in treatment or the disease is identified during a surgical consultation, the value of such therapy often remains unappreciated for a long time.

Materials and Methods

This prospective study was conducted in Govt. Hospital for Bone and Joint Surgery, an associated hospital of Govt. Medical

College, Srinagar after clearance by institutional ethical committee and took place from July 2019 to August 2021. During this period, patients with De Quervain's tenosynovitis who had taken conservative treatment but showed no improvement for six months confirmed by clinical examination, and USG with pain interfering with daily activities of life were taken into study.

Total 45 patients were including in this study which were divided into three groups viz, Group L (longitudinal); Group T (transverse) and Group O (oblique). All patients were operated in Govt. Hospital for Bone and Joint Surgery, an associated hospital of Govt. Medical College, Srinagar under local anesthesia using 2% lidocaine HCL and tourniquet. The skin was infiltrated with 2% lidocaine HCL and then painting and draping was done followed by skin incision (Fig 1A, B and C). All patients to be operated were put in supine position and the limb to be operated held in neutral position.



Fig 1: A (Longitudinal skin incision), B (Transverse skin incision) and C (Oblique skin incision)

Statistical methods

The recorded data was compiled and entered in a spreadsheet (Microsoft Excel) and then exported to data editor of SPSS Version 20.0 (SPSS Inc., Chicago, Illinois, USA). Continuous variables were expressed as Mean \pm SD and categorical variables were summarized as frequencies and percentages. Graphically the data was presented by bar and pie diagrams. A P-value of less than 0.05 was considered statistically significant.

Results

All the patients were right-hand dominant. The majority of the patients had involvement of the right side with the longitudinal and transverse incision group having right side and left side involvement of 60% and 40% respectively while as the oblique incision group had right side and left side involvement of 53.3% and 46.7% respectively. The Chi-square was found to be 1.245 with a P- value of 0.537. [Table 1]

Table 1: Side involved among study patients in three groups

Side involved	Group L		Group T		Group O	
	No.	%age	No.	%age	No.	%age
Right	9	60.0	9	60.0	8	53.3
Left	6	40.0	6	40.0	7	46.7
Total	15	100	15	100	15	100

Chi-square=1.245; p value=0.537

Majority of the patients in the longitudinal incision group were found to be housewives accounting to about 60% of the study group followed by student (13.3%), typist (13.3%), mechanic (6.7%) and baker (6.7%). The transverse incision group found housewives accounting to 66.7% of the study group followed by student (13.3%), typist (6.7%), mechanic (6.7%) and baker (6.7%) while as the oblique incision group found housewives accounting to 53.3% of the study group followed by student (20.0%), typist (13.3%), mechanic (6.7%) and baker (6.7%). The Chi-square was found to be 0.908 with a P- value of 0.997.

[Table 2]

Table 2: Occupation of study patients in three groups

Occupation	Group L		Group T		Group O	
	No.	Age %	No.	Age %	No.	Age %
Housewife	9	60.0	10	66.7	8	53.3
Student	2	13.3	2	13.3	3	20.0
Typist	2	13.3	1	6.7	2	13.3
Mechanic	1	6.7	1	6.7	1	6.7
Baker	1	6.7	1	6.7	1	6.7
Total	15	100	15	100	15	100

Chi-square=0.908; P-value=0.997

The duration of symptoms in the longitudinal incision group of 15 patients had a mean of 4.3 months with a standard deviation of 1.595 and ranging between 3-8 months while as the duration of symptoms in the transverse incision group of 15 patients had a mean of 4.5 months with a standard deviation of 1.807 and ranging between 3-9 months. The duration of symptoms in the oblique incision group of 15 patients had a mean of 4.9 months with a standard deviation of 1.598 and ranging between 3-8 months. The P-value for all this data was found to be 0.734. [Table 3]

Table 3: Duration of symptoms (months) among study patients in three groups

Duration of symptoms	N	Mean	SD	Range	P-value
Group L	15	4.3	1.595	3-8 Months	0.734
Group T	15	4.5	1.807	3-9 Months	
Group O	15	4.9	1.598	3-8 Months	

Mean VAS score in the longitudinal incision group reduced from 9.33 ± 0.617 (range 8-10) to 1.27 ± 0.458 (range 1-2), in the transverse incision group from 9.53 ± 0.640 (range 8-10) to 1.73 ± 0.704 (range 1-3) and in the oblique incision group from 9.40 ± 0.737 (range 8-10) to 1.60 ± 0.828 (range 1-3). The P-value

for all this data shows significant reduction from 0.734 (pre-operative) to 0.167 (post-operative) [Table 4].

Table 4: VAS score of study patients in three groups

Groups	Number	Pre-operative			Post-operative		
		Mean	SD	Range	Mean	SD	Range
Group L	15	9.33	0.617	8-10	1.27	0.458	1-2
Group T	15	9.53	0.640	8-10	1.73	0.704	1-3
Group O	15	9.40	0.737	8-10	1.60	0.828	1-3
P-value		0.734			0.167		

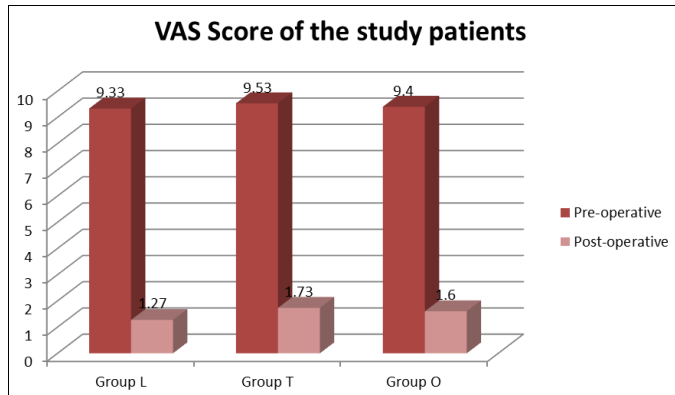


Fig 2: VAS Score of the study patients

The prevalence of nerve damage in longitudinal incision group was 0.0% while as it was 13.3% in both transverse and oblique groups with a P-value of 0.334. The prevalence of vein damage in longitudinal incision group was 0.0% while as it was 33.3% and 26.7% in transverse and oblique groups respectively which was statistically significant with a P-value of 0.045. There was one case of hypertrophic scar formation accounting to 6.7% in longitudinal incision group while as there was no such complication reported in transverse and oblique groups. Overall, statistically significant difference was found between longitudinal and the other two groups with a P-value of 0.041. [Table 6].

Table 6: Prevalence of complications in three groups

Complications	Group L		Group T		Group O		P-value
	No.	%age	No.	%age	No.	%age	
Nerve damage	0	0.0	2	13.3	2	13.3	0.334
Vein damage	0	0.0	5	33.3	4	26.7	0.045*
Hypertrophic scar	1	6.7	0	0.0	0	0.0	0.359
Total complications	1	6.7	7.0	46.7	0	40.0	0.041*

*Statistically significant difference between Group T and Group O with Group L

Discussion

The aim of the study was to assess and evaluate the outcome of

various incisions in the management of De-Quervain disease. In this study the clinical outcomes were evaluated 1 week, 2 week, 6 week and final follow up was done at 6 months. In the longitudinal Group, most of the patients in our study had the involvement of right side with right to right ratio of 1.5:1. In study by Abrisham SJ *et al* (2011) [3], the ratio was 1:0.7 and in the study by Kumar K *et al* (2015), it was 1:1.4. In the transverse Group, most of the patients in our study had the involvement of right side with right to left ratio of 1.5:1. In study by Abrisham SJ *et al* (2011) and Kumar K *et al* (2015) [8], it was 1:0.7 and 1:1.7 respectively. In the oblique group, most of the patients in our study had the involvement of right side with right to left ratio of 1.1:1. In study by Mir BA *et al* (2020) [9], it was found to be 1:0.2. The mean pre operative symptom duration in longitudinal group of our study was 4.3 months. In study by Kumar K *et al* (2015), it was found to be 2.8 months. The mean pre-operative symptom duration in transverse group of our study was 4.5 months. In study by Kumar K *et al* (2015), it was found to be 3.56 months. The mean pre-operative VAS score in longitudinal Group of our study was 9.33. In study by Kumar K *et al* (2015) [8], this mean preoperative VAS score was 9.35 which is comparable to our study. The mean pre-operative VAS score in Transverse Group of our study was 9.53 which was comparable to 9.4 of study by Kumar K *et al* (2015). The mean pre-operative VAS score in Oblique Group of our study was 9.40 which was comparable to 9.2 of study by Mir BA *et al* (2020) [9]. The mean post-operative VAS score in Longitudinal Group of our study was 1.27. In study by Kumar K *et al* (2015), this was found to be 4.13. The mean post-operative VAS score in Transverse Group of our study was 1.73. In study by Kumar K *et al* (2015) [8], this was found to be 3.0. The mean post-operative VAS score in Oblique Group of our study was 1.6 which is very much comparable to study by Mir BA *et al* (2020) with a score of 1.3.

Abrisham [3] SJ *et al* (2011) completed a randomised controlled clinical study done in three institutions in Iran, Yazd from March 2003 to September 2008. One hundred-twenty patients with De Quervain illness who did not respond to conservative therapy were operated with two separate incisions. The patients were followed for three months to compare the surgery results. During a three-month follow-up, a significant difference was found between the two approaches ($p=0.03$). Results of surgical therapy with longitudinal incision were satisfactory (only 5 hypertrophic scars), whereas there were 13 postoperative complaints with transverse incision. They determined that longitudinal incision in surgical therapy of De Quervain disease is better than transverse incision. Most of the patients in the longitudinal group of our study had no complications (93.3%). Only one patient (6.7%) had hypertrophic scar which resolved over subsequent follow-ups. In study by Abrisham SJ *et al* (2011) and Kumar K *et al* (2015) [8], the percentage of hypertrophic scar was 9.2% and 4.1% respectively.

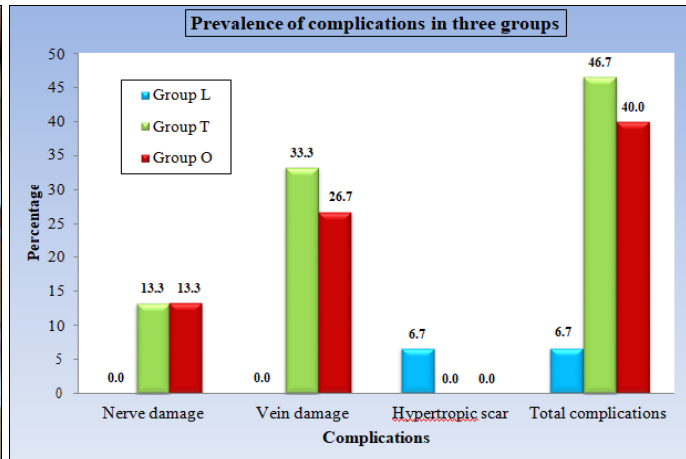


Fig 4: Hypertrophic scar formation

Poublon^[4] AR *et al* (2018) undertook a research to evaluate which of the widely utilised incision procedures had the lowest likelihood of iatrogenic harm to the nerves. They found that for starting surgeons, the longitudinal gives excellent exposure and minimal danger of iatrogenic nerve injury. In our study, the transverse Group, majority of the patients too had no complications (53.3%). 5 patients (33.3%) had vein damage and 2 patients (13.3%) had nerve damage. In study by Abrisham SJ *et al* (2011) and Kumar K *et al* (2015), the percentage of vein damage was 9.6 and 12.5% respectively and the percentage of nerve damage was 5.8 and 12.5% respectively. Most of the patients in the Oblique Group of our study too had no complications (60%). 4 patients (26.7%) had vein damage and 2 patients (13.3%) had nerve damage.

Conclusion

Compared to the other two incisions, the longitudinal incision is a safe and simple procedure because it makes it simple to identify compartment variations, superficial radial nerve branches, the cephalic vein, and it prevents palmar tendon subluxation by releasing the compartment sheath more dorsally. In this research, we found that longitudinal incisions cause less nerve and vein damage than transverse and oblique incisions. In light of this, the longitudinal incision is preferable and ought to be employed for De-quervain illness surgical decompression.

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Conflict of Interest

Not available

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