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### RESEARCH ARTICLE

#### A COMPARATIVE STUDY ON THE OUTCOMES AND COST OF SURGERY VERSUS SCLEROTHERAPY IN THE MANAGEMENT OF HYDROCELE

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#### Abstract

**Background:** Hydrocele accounts for 1% of adult men. Hydrocelectomy considered gold standard, there has been renewed interest in alternatives like aspiration and sclerotherapy, which is less invasive, has less morbidity and complications.

**Aim:** To assess outcomes and cost associated with surgery versus sclerotherapy as management of hydrocele

**Materials and Methods:** This retrospective study from June 2020 to Dec 2022 conducted in department of general surgery, tertiary care center – Kalaburagi. Patients who underwent surgical treatment through the Jaboulay technique (n=76) and sclerotherapy (n=60) evaluated.

**Results:** The mean age for surgery 52 yrs versus sclerotherapy 56 yrs, mean time between onset of hydrocele and first outpatient evaluation was 34 months for surgery versus 40 months sclerotherapy, mean volume aspirated was 475mL for surgery and 375mL sclerotherapy, mean hospital stay duration for surgery group was 48hrs and sclerotherapy 4 hrs, mean follow-up period was 60 days after surgery and 30 days sclerotherapy. No significant complications occurred in any patient, mean cost per patient was INR 1500 rupees in Surgery Group and 500 rupees Sclerotherapy Group.

**Conclusion:** Sclerotherapy is cost effective management for hydrocele compared to Jaboulay procedure with high success rate, lesser complications, fast discharge.

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#### Introduction:-

Hydrocele accounts for about 1% of adult men and primary hydrocele is the most common form (1). Fluid accumulates between parietal and visceral layers of tunica vaginalis. Inadequate absorption of the fluid by tunica vaginalis results in hydrocele (2). Most hydroceles do not require surgical treatment (4), but when they are large enough to cause bothersome symptoms, surgery has high success rates (5,6). Hydroceles can cause symptoms at any age. It can cause erectile dysfunction in aging men. Erectile dysfunction is more prevalent in this group of men and hence management of the condition is essential. (10) Although hydrocelectomy is considered the gold standard technique,

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there has been renewed interest in cheaper alternatives like aspiration and sclerotherapy, which is less invasive, has less morbidity and complications(14).

Sclerotherapy for symptomatic hydrocele testis has been increasingly used and advocated as a minimally invasive procedure, and a variety of sclerosing agents have produced different outcomes(15). Surgical management has good results but has complications like postoperative pain, haematoma, injury to the scrotal contents and wound infection(2). Sclerotherapy fuses the visceral and parietal layers of the tunica vaginalis, obliterating the potential space for recurrence of the hydrocele(8). It has gained broad acceptance because of its less invasive nature, low morbidity, and a faster recovery time(9).

### Objective:-

To assess the outcomes and the cost associated with surgery versus sclerotherapy as management of hydrocele.

### Methods:-

Study conducted at the Department of general surgery, Tertiary care hospital– Kalaburagi. All men treated for hydrocele between June 2020 to Dec 2022 were retrospectively analyzed. Patients who underwent surgical treatment through the Jaboulay technique(n=76) and sclerotherapy(n=60) were further evaluated.

The Jaboulay technique was performed as follows: through a median scrotal incision, the hydrocele was aspirated, the vaginal tunica excess was removed and followed by eversion over the spermatic cord. The patients were admitted and procedure was carried under spinal anesthesia. Sclerotherapy was routinely performed under local anesthesia, on an outpatient basis, and with ultrasound control. Patients in supine position To evaluate the testicle and hydrocele scrotal was done , also to determine the best drainage spot. With 2% lidocaine scrotal skin was anesthetized. A 16-gauge needle was inserted through ultrasound guidance, and the hydrocele fluid was aspirated. After all the fluid was removed, 20mL of 2% lidocaine was injected and left for 2 minutes. The lidocaine was then removed, and sclerotherapy agent(sterile alcohol 100%) was inserted according to our protocol: 10% of the removed volume up to 50mL. Then the needle was removed and local compression given for 2 minutes. Patients were observed for 1 hour and discharged, if uneventful. Recurrence was defined as any visible or palpable fluid collection that appeared and persisted after three months. For comparison of effectiveness among the techniques, up to two sclerosis procedures defined the technique successful. Indian rupees currency rate was used in the present study.

### Results:-

The mean age for both groups were similar (surgery 52 years versus sclerotherapy 56 years; p=0.22) (Table no.1). The mean time between the onset of hydrocele and the first outpatient evaluation was 34 months for surgery versus 40 months for sclerotherapy . The volume of hydrocele measured through ultrasound was similar in both groups (300ml for Surgery and 325ml for Sclerotherapy).

**Table No 1.:-** Preoperative Data.

Variants	Surgery(n=76)	Sclerotherapy(n=60)	P value
Age, years (mean)	52	56	0.22
Onset of symptoms, months	34	40	
Volume of hydrocele in USG, ml	300	325	

The mean volume aspirated was 475mL for surgery and 375mL for sclerotherapy (Table no. 2). 76 patients who underwent surgery received spinal anesthesia. 60 patients of sclerotherapy group received local anesthesia. A drain was placed at the surgeon's discretion after each surgery and maintained for 24 hours. The mean hospital stay duration for surgery group was 48hrs and sclerotherapy was 4 hrs . The mean follow-up period was 60 days after surgery and 30 days after sclerotherapy. No significant complications occurred in any patient (Table no. 3). Hydrocele recurred in two men (3.8%) who underwent surgery. For these patients, aspiration and sclerotherapy was performed. For eight men (14%) in the Sclerotherapy Group, a second procedure was required, and for one of these men in surgery group and two men in sclerotherapy group, a third procedure was performed to obtain success (Table no. 4).

**Table No 2.-** Results Of Perioperative Data.

Variants	Surgery (n=76)	Sclerotherapy (n=60)	P value
Anesthesia			
Local	0	60	
Spinal	76	0	
Volume aspirated, ml	475	375	
Clear	66	54	0.57
Turbid	10	6	
Hospital stay, hours	48	4	
Follow ups, days	60	30	

**Table No 3:-** Results Of Complications.

Variants	Surgery (n=76)	Sclerotherapy (n=60)	P value
Complications			0.093
Pain >3days	4	0	
Fever	3	1	
Edema	7	3	
Wound infection	3	2	
Haematoma	2	1	
Recurrence	3	9	

**Table No. 4:-**Results Of Recurrences.

Variants	Surgery (n=76)	Sclerotherapy (n=60)	P value
First recurrence	2	8	0.3
Volume aspirated, ml	400	150	
Clear	2	5	
Turbid	0	3	
Second recurrence	1	2	1
Volume aspirated, ml	50	100	
Clear	1	2	
Turbid	0	0	

The mean cost per patient was INR 1500 rupees in the Surgery Group and INR 500 rupees in the Sclerotherapy Group (P value <0.0001). Cost directly related to in-hospital treatment procedures were significantly higher for surgery versus sclerotherapy (Table no.4).

**Table No. 4:-** Cost Of The Procedure.

Variants	Surgery	Sclerotherapy	P value
Procedure charge, Indian rupees	1500	500	<0.0001

### Discussion:-

Sclerotherapy is another treatment option with a single-treatment success rate ranging from 33% to 75%. This option may be a good choice for patients who cannot tolerate anaesthesia or who refuse surgical treatment. The common steps of the procedure include needle aspiration of the hydrocele fluid, followed by injection of local anaesthesia, and ultimately instillation of the sclerosing agent. The most commonly used sclerosing agent is tetracycline, although 2.5% phenol solutions, 95% alcohol, and ethanolamine oleate also have been used effectively. When sclerotherapy was compared with hydrocelectomy, the success rate was higher in hydrocelectomy, although the hydrocelectomy group had a higher complication rate (16).

The treatment options for hydrocele includes observation injection aspiration and surgery. Hydrocelectomy is considered the gold standard(1). However, it needs to be performed in the operating room, often with spinal, increasing the cost of care compared to sclerotherapy(9,10).It leads to loss of working days which is seven times longer in hydrocelectomy compared to sclerotherapy especially in young adults (10).

It is observed a higher cost associated with the surgical procedures when compared to sclerotherapy (table no. 4). Even though the cost with hydrocele treatment are nothing, it is a common disease. Other authors have shown that hydrocelectomy can be higher cost than sclerotherapy(4).

Additionally, sclerotherapy was performed as an outpatient procedure. It brings the advantage over in patient surgery not only regarding the costs but also convenience for patients. Hydrocelectomy can be performed as an outpatient procedure though associated with higher complications(11,12).

As patients live far from facilities, it is choice not to perform hydrocelectomy as an outpatient procedure . For sclerotherapy, since risks are low, outpatient adopted as routine.

Hydrocelectomy had only two failures in the series, both successfully treated through sclerotherapy. By increasing the number of treatments offered to patients before surgical options were explored better success rates of sclerotherapy can be gained (4).

Therefore Sclerotherapy is good alternative option for the management of hydrocele, mainly in elderly patients and those unfit for surgery, as observed by other authors(5). Added advantages are the patient does not need to be fasting, can maintain usual medications and spinal anaesthesia and its risks can be avoided. After surgical procedures complications were more common , and no such events were seen in the Sclerotherapy Group. Though complications have been reported after sclerotherapy, they are not common(4).

A concern in young patients is spermatogenesis. Shan CJ, Lucon AM, Arap S., in his study of Comparative study of sclerotherapy with phenol and surgical treatment for hydrocele,reported that no significant impairment in spermatogenesis or fertility occurred after sclerotherapy, assuring the safety of the procedure even in young men(8).

John J Francis and Laurence A. Levine concluded in their study of Aspiration and Sclerotherapy: a Nonsurgical Treatment Option for Hydrocelethat AS appears to be a safe, quick, far less costly and reasonably effective in-office procedure for the treatment of non septated simple hydroceles(13).

### **Conclusion:-**

Sclerotherapy is an effective management option for hydrocele compared to Jaboulay procedure. It has high success rate, lesser complications, fast discharge and patients return quicker to activities of daily living. No drain and major anesthesia are required. The recurrence are similar after both procedures, but cost is significantly lower after sclerotherapy.

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