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RESEARCH ARTICLE
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A CLINICAL STUDY OF VARIOUS PRESENTATION AND TREATMENT OUTCOME OF VARICOCELE

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ABSTRACT

Backgrounds

Despite being first described two thousand years ago, the varicocele remains a controversial multifaceted disease process with numerous biological consequences including infertility, hypogonadism, and chronic orchidalgia. Despite a high prevalence amongst asymptomatic fertile men, varicoceles paradoxically also represent the most common correctable cause for male infertility.

Objectives

The objective of the study is to study the various clinical presentation and treatment outcome of varicocele.

Methods

A prospective clinical study was undertaken at K.R. Hospital attached to Mysore Medical College and Research Institute, Mysore to observe and document the various clinical presentation and treatment outcome of varicocele.

Results

Varicocele was more prevalent among the 3rd decade in our study. Infertility was the most prevalent presentation (46%) followed by scrotal pain / discomfort (44%) among study population. 10% of our study population was asymptomatic. In our study, on USG of scrotum, 40 patients (80%) had Grade 4 varicocele, 8 (16%) had Grade 3 and 2 patients (4%) had grade 2 varicocele and 42 patients had abnormal semen analysis. On comparison of USG grading with the semen analysis, 81% of the patients with abnormal semen analysis had Grade 4 varicocele.($p<0.05$), 3 patients had hydrocele as complication of the surgery.

Conclusion

The present study concludes that infertility and scrotal discomfort were the most prevalent complaints on presentation. Grade 4 varicocele was prevalent among the symptomatic patients and patients with abnormal semen analysis. All the surgical approaches were equally effective with only 3 cases of hydrocele development in subinguinal approach. 54% of the patients had improved symptoms after surgery.

Keywords: Varicocele, laparoscopy, scrotal pain, infertility, semen analysis, complications

INTRODUCTION

A varicocele is an abnormal dilation of the pampiniform plexus of veins in the scrotum which begins at puberty in approximately 15% of males. Although common in the general population and often asymptomatic, varicoceles are associated with gonadal dysfunction including testicular atrophy, infertility, and hypogonadism in a subset of men diagnosed later in life. [1]

Varicocele is identified in 7% and 10%–25% of prepubertal and post pubertal males, respectively.[2,3]

Approximately 8% of men in reproductive age seek medical assistance for fertility-related problems. Among them, 1%– 10% carry a condition that compromise their fertility potential and varicocele alone accounts for 35% of these cases.[4,5]

It is well known that the ipsilateral testis in patients with varicoceles is smaller than the other side.[6]

Some cases present with scrotal or inguinal aching discomfort or dragging pain. Classical description of varicocele is the consistency of "Bag of Worms" that can be decompressed when patient is in supine position.[7]

Because of the high prevalence and uncertain pathogenesis, definitive management guidelines for varicoceles diagnosed in the pediatric and adolescent population remain poorly defined.[1]

The surgical treatment is varicocelectomy which involves ligation of testicular veins. Access to the veins can be gained through subinguinal, trans inguinal, or suprainguinal incision. This operation can be done by open, laparoscopic, microscopic, or embolization unilaterally or bilaterally .[8,9]

This study was undertaken to study the various clinical presentations and treatment outcomes of varicocele.

OBJECTIVES OF THE STUDY

1. To observe and document the various clinical presentation and treatment outcomes of varicocele
2. To co-relate the clinical presentation and the treatment outcomes studied in varicocele

MATERIALS AND METHODS

A prospective clinical study was conducted over a period of 18 months (February 2021 to August 2022) at K.R Hospital attached to Mysore Medical College and Research Institute, Mysore to observe and document the various clinical presentation and treatment outcome of varicocele. The patient selection was by purposive sampling.

All patients with diagnosis of varicocele were included in the study with their informed consent.

A detailed clinical history was elucidated, followed by careful clinical examination, which were recorded as per proforma. The details of age, gender, mode of presentation of illness, family history, clinical examination, investigations and treatment were collected

The inclusion and exclusion criteria were as follows:

Inclusion criteria

1. Patient giving valid consent for the study.
2. Patients diagnosed with Varicocele
3. patients above the age of 18 years

Exclusion criteria

1. Patients below 18 years of age.
2. All cases of Bilateral varicocele with renal cell carcinoma.
3. Patients not giving consent for the study.

Sample size

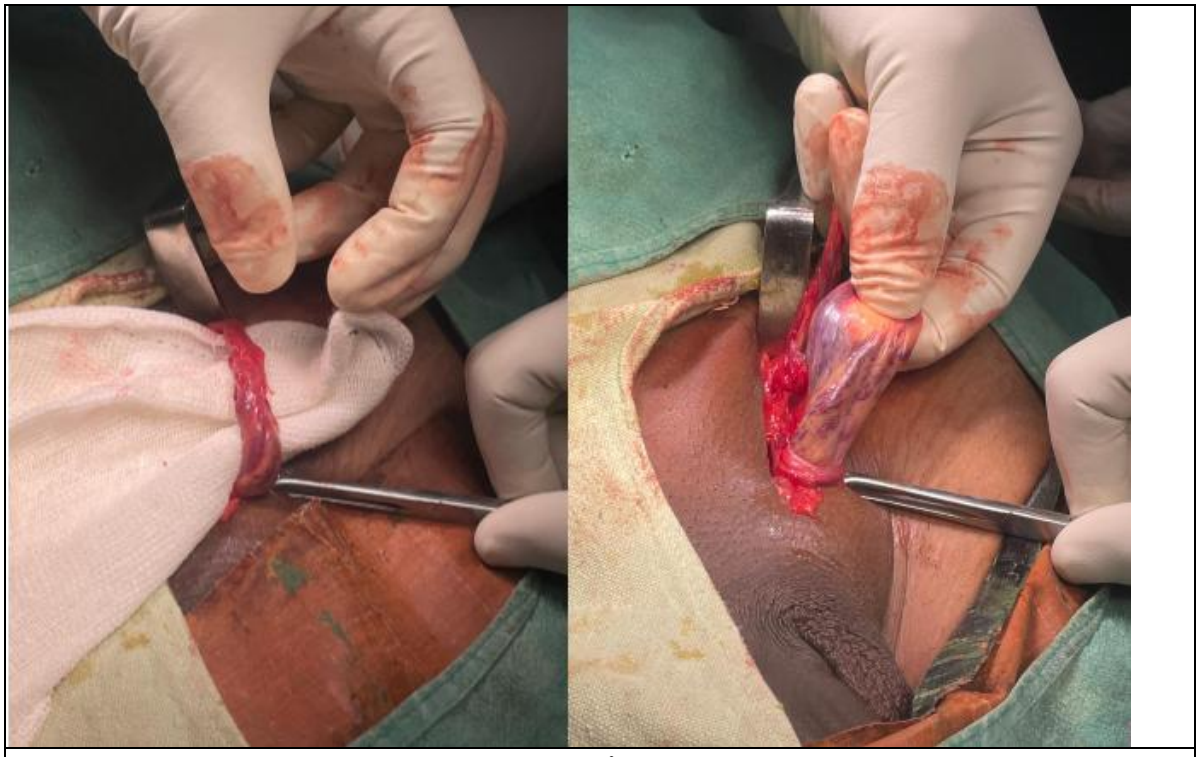
The minimum sample size is based on formula $n = \frac{Z2pq}{d^2}$

d=Mean difference=0.05

Z=1.96 at 5% α error

P=prevalence of varicocele = 15 %

Q=1-p
There by total sample size is 50.



Intraoperative Images

RESULTS

Clinical presentation	Number of patients	% of patients
Asymptomatic	5	10.0%
Scrotal pain/discomfort	22	44.0%
Infertility	23	46.0%
Total	50	100.0%

Table 1: Clinical presentation among study population

In our study, Infertility was the most prevalent presentation (46%) followed by scrotal pain / discomfort (44%) among study population. 10% of our study population was asymptomatic.

		Clinical diagnosis					
		Grade 2		Grade 3		Subclinical	
		Number of patients	% of patients	Number of patients	% of patients	Number of patients	% of patients
Clinical presentation	Asymptomatic	0	0.0%	5	100.0%	0	0.0%
	Scrotal pain/discomfort	6	27.3%	16	72.7%	0	0.0%
	Infertility	9	39.1%	13	56.5%	1	4.3%

Table 2 Comparison of clinical presentation and grade

In our study, Most of the symptomatic patients had Grade 3 varicocele. 13 (56.5%) of patients with infertility had grade 3, 9(39.1%) patients had grade 2 among our study population, Similarly, 16 patients (72.7%) with scrotal pain / discomfort had grade 3 varicocele and 6 patients (27.3%) had grade 2 varicocele.

			Clinical diagnosis		
			Grade 2	**Grade 3**	**Subclinical**
USG scrotum grading	Grade 2	Number of patients	2	0	0
		% of patients	13.3%	0.0%	0.0%
	Grade 3	Number of patients	3	4	1
		% of patients	20.0%	11.8%	100.0%
	Grade 4	Number of patients	10	30	0
		% of patients	66.7%	88.2%	0.0%
	total	Number of patients	15	34	1
		% of patients	100.0%	100.0%	100.0%

Table 3 Comparison of radiological grading and clinical presentation

On comparison of clinical grading with USG grading of varicocele it was fount that there no statistically significant difference.

		Number of patients	**% of patients**
Semen analysis	Normal	8	16.0%
	Abnormal	42	84.0%
	Total	50	100.0%

Table 4 Semen Analysis

In our study, on semen analysis, it was found that 42 patients had abnormal semen analysis.

			Semen analysis	
			Normal	**Abnormal**
USG scrotum grading	GRADE2	Number of patients	0	2
		% of patients	0.0%	4.8%
	GRADE3	Number of patients	2	6
		% of patients	25.0%	14.3%
	GRADE4	Number of patients	6	34
		% of patients	75.0%	81.0%
	Total	Number of patients	8	42
		% of patients	100.0%	100.0%

Table 5 Comparison of USG grading and Semen analysis

On comparison of USG grading with the semen analysis, 81% of the patients with abnormal semen analysis had Grade 4 varicocele. The distribution is statistically significant.

		Number of patients	**% of patients**
COMPLICATION	No Complication	47	94.0%
	Hydrocele	3	6.0%
	Total	50	100.0%

Table 6 Distribution of complications

		Outcome			
		No change		Improved	
		Number of patients	% Of patients	Number of patients	% of patients
Surgery	Inguinal	1	25.0%	3	75.0%
	Laparoscopic	5	31.3%	11	68.8%
	Subinguinal	17	56.7%	13	43.3%
	Total	23	46.0%	27	54.0%

Table 7: Comparison of surgical approach and outcome

On comparing the surgical approach and the outcome, it was found that 68.8% of patients with laparoscopic surgery had improved symptoms, 75% of patients with inguinal and 43.3% of patients with subinguinal approach had improved symptoms.

		Complication			
		No Complication		Hydrocele	
		Number of patients	% of patients	Number of patients	% of patients
Surgery	Inguinal	4	100.0%	0	0.0%
	Laparoscopic	16	100.0%	0	0.0%
	Subinguinal	27	90.0%	3	10.0%
	Total	47	94.0%	3	6.0%

Table 8: Comparison of surgical approach and complications

In our study, there were 3 patients with hydrocele as complication, all patients had subinguinal surgery.

DISCUSSION

Several surgical procedures have been documented for the treatment of varicocele. Regarding the open approach, the retroperitoneal ligation according to Palomo (transverse skin incision two fingerbreadths medial and inferior to the homolateral anterosuperior iliac spine), the inguinal ligation according to Ivanissevich (transverse skin incision opposite the deep inguinal orifice), subinguinal ligation (transverse skin incision over the superficial inguinal orifice), microsurgery (using the same approaches and magnifying glasses or a surgical microscope) and antegrade sclerotherapy according to Tauber (skin incision at the root of the homolateral hemiscrotum) (skin incision at the root of the homolateral hemiscrotum).

The laparoscopic method permits the closure of the spermatic veins a few millimetres from the internal inguinal opening. Finally, radiological embolization is suggested (through the femoral or jugular vein).

Several studies have contrasted these various methodologies. The ideal approach would have the fewest problems and the biggest improvement in the postoperative sperm count with a greater rate of spontaneous conception. Postoperative complications of varicocele surgery can occur in 1 percent –5 percent of patients overall. All surgical procedures may be accompanied with a risk of an infectious consequence (orchitis, wall infection), hydrocele, recurrence of the varicocele or testicular atrophy.

The single-centre retrospective research by Ghozzi et al.[10] indicated that anterograde scrotal sclerotherapy was an equally successful, straightforward and repeatable procedure in the treatment of idiopathic varicocele, with decreased morbidity and postoperative stay compared to laparoscopy and open surgery. In a prospective randomised research, Simforoosh et al.[11] compared open surgery versus laparoscopy. After six months of follow-up, surgical complication rates were comparable.

Another randomised trial comparing inguinal ligation (Ivanissevich), laparoscopy, and microsurgical sublingual ligation included 298 infertile individuals. Similar rates of postoperative complications were seen; however microsurgery was associated with much lower rates of recurrence and hydrocele.

Zucchi et al.[12] contrasted the open inguinal technique with sclerotherapy in a randomised experiment. The complication rates were similar.
Sautter compared sclerotherapy to laparoscopy in a randomised clinical study. Sclerotherapy was associated with much fewer early postoperative problems, whereas recurrence rates were comparable.
In a recent meta-analysis of several surgical procedures, microsurgery had the lowest incidence of postoperative complications (0.44 percent hydrocele and 1.05 percent recurrence) whereas Palomo's approach had the highest (8.24 percent hydrocele and 14.97 percent recurrence) (8.24 percent hydrocele and 14.97 percent recurrence).
According to a research by Ouanes Y et al.,[13] surgical treatment of varicocele enhanced sperm concentration and motility. However, neither surgical procedure was statistically substantially better, and the outcomes were comparable.
The retrospective single-center research by Khouni[14] demonstrated a statistically significant improvement in postoperative spermogram parameters (sperm count and motility) in the group of patients treated with anterograde sclerotherapy compared to those treated with open surgery and laparoscopy.
Simforoosh[11] compared laparoscopic surgical therapy to open retroperitoneal surgery in a prospective randomised experiment. After six months of follow-up, sperm parameters remained unchanged.
In the randomised Al-Said research (298 infertile individuals with clinical varicocele), open inguinal surgery, laparoscopy, and sublingual microsurgery were compared. There was a notable improvement in sperm concentration, motility, and morphology. However, the improvement in concentration and motility was substantially larger in individuals treated with microsurgery. Antegrade sclerotherapy was compared with microsurgery through the inguinal route in the treatment of clinical left varicocele in another randomised investigation. Postoperatively, sclerotherapy dramatically enhanced the rate of progressive sperm motility.
In our research, 23 individuals presented with Infertility among whom, 5 patients (27 percent) improved on surgery.
A meta-analysis was conducted to compare surgical treatments for varicocele. The microsurgical method was related with the greatest probability of spontaneous pregnancy (41.97 percent), while laparoscopy was associated with the lowest rate of spontaneous pregnancy (30.07 percent).
In our research 3 individuals had hydrocele formed following subinguinal approach for the operation.
In the randomised trial conducted by Al-Said comparing open inguinal approach, laparoscopy, and microsurgical sub-inguinal ligation, there was no significant difference in spontaneous pregnancy.

LIMITATIONS

Several limitations of this study must be acknowledged before interpreting our findings. First, this study was based on a limited population at a single institution with a small sample size. Second, the distribution of patients to treatment techniques was not defined. Despite these limitations, our study showed the efficacy of three different surgical techniques in the management of varicocele. Finally, a large-scale, multicenter, prospective study is needed to confirm these results.

CONCLUSION

The present study was done in patients who presented with Varicocele to K R Hospital, Mysuru. Detailed history and examination findings were documented. The mean age of presentation of varicocele in our study was in 3rd decade (31.18 years).
The present study concludes that infertility and scrotal discomfort were the most prevalent complaints on presentation. Grade 4 varicocele was prevalent among the symptomatic patients and patients with abnormal semen analysis. All the surgical approaches were equally effective with only 3 cases of hydrocele development in subinguinal approach. 54% of the patients had improved symptoms after surgery.
However, a large volume multicentre studies are required to analyse the effect of surgery on outcome and semen analysis.

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