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Original Article

Role of Scrotal Support to Prevent Scrotal Edema After Inguinal Hernioplasty

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ABSTRACT

Inguinal hernia is a quite common condition that is often seen in the elderly as compared to younger patients. **Objective:** To find out the prevalence of patients developing scrotal edema after inguinal hernioplasty and evaluate the role of scrotal support in avoiding it in our setting. **Methods:** We conducted a cross-sectional study at K.V.S.S. Site Hospital, Karachi for the period of January 2021 to December 2022. All the data that were collected and analyzed on the latest version of SPSS. The frequencies calculated for the categorical data while the mean found for the numerical data. The chi-square test was run to find out the effectiveness of scrotal support in reducing the frequency of scrotal swelling. A p-value of less than 0.05 was considered significant. **Results:** 50(55.6%) patients were in the age group of 50-70 years. The majority were smokers (66.7%) and had a BMI>30 (83.3%). 40(44.4%) patients had a significant surgical history. The majority of the patients in our study had diabetes (66.7%). 59% of the patients in our study had an indirect hernia. 25(27.8%) patients who were not given scrotal support developed scrotal edema however only 1(1.1%) who were provided scrotal support immediately after the surgery developed scrotal edema. The association between scrotal support and scrotal edema was statistically significant ($p<0.01$). **Conclusions:** Scrotal support has a positive role in preventing scrotal edema in our study.

INTRODUCTION

Inguinal hernia is a quite common condition that is often seen in the elderly as compared to younger patients. The prevalence has increased from 11 per 10000 people in the age group 16-24 years to 200 per 10000 people in the age group 75 years or above [1]. Inguinal hermioplasty is one of the most commonly performed elective surgical procedures to treat an inguinal hernia. However, no repair is considered universally ideal that could prevent complications which include bleeding, recurrence, infection, scrotal swelling, scrotal edema, and nerve damage [2]. According to reports, more than 500000 inguinal hernia repairs are performed annually [3]. Additionally, the rise in the aging population has also led to an increase in the demand for additional surgical services for inguinal hernia. It is reported that inguinal hernia causes discomfort and the procedure of hernioplasty improves the quality of life of the patients [4-6]. The inguinal hernioplasty is an important procedure as an untreated hernia can lead to acute life-threatening complications such as intestinal obstruction, infarction, and strangulation [7]. Scrotal hematoma and scrotal edema are quite significant complications of the inguinal hernioplasty and are the cause of significant morbidity [8]. Various techniques have been used to avoid it. Among these

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techniques, the most effective one was the use of scrotal support which provides varying degrees of success in avoiding these complications [9].This study aims to find out the prevalence of patients developing scrotal edema after inguinal hernioplasty and evaluate the role of scrotal support in avoiding it in our setting. This was the first study from our region that determine the effectiveness of scrotal support. The major objective of this study was to find out the effectiveness of scrotal support in preventing patients from developing scrotal edema after inguinal hernioplasty.

METHODS

We conducted a cross-sectional study at K.V.S.S. Site Hospital, Karachi for the period of January 2021 to December 2022. Ethical approval was taken from the respective institute. Non-probability, the Convenience sampling method was used to collect the data from the participants. The sample size for this study was calculated to be 90 patients. It was calculated using the Raosoft sample size calculator using a confidence level of 95%, a margin of error of 5%, and the incidence of inguinal hernia to be 117 in our region [10]. The Inclusion criteria were all the male patients who were above 18 years of age, has an inguinal hernia for the first time, had no previous history of inguinal-scrotal surgery had a unilateral hernia, and gave consent to be part of this study. The exclusion criteria included patients with recurrence, bilateral hernia, had scrotal swelling preoperatively, All the patients who refused to give consent to be part of this study, All the patients who had undergone general anesthesia were excluded from the study, and females were also excluded from this study. We performed a cross-sectional study where we included patients with inguinal hernia visiting our hospital and fulfilled the inclusion. The pre-designed questionnaire was used to collect the data for this study. The questionnaire included questions related to the demographics of the patients. Written informed consent was taken from the patients who have inguinal hernioplasty. They were provided with scrotal support after the procedure. The patients were then followed up after 1-day and 1-week postoperatively to check for the development of scrotal edema. All the data that were collected analyzed on the latest version of SPSS. The frequencies calculated for the categorical data while the mean found for the numerical data. The chi-square test was run to find out the effectiveness of scrotal support in reducing the frequency of scrotal swelling. A p-value of less than 0.05 was considered significant.

RESULTS

Table 1 shows the demographic variables of the patients. 50(55.6%) patients were in the age group of 50-70 years. The majority were smokers (66.7%) and had a BMI>30 (83.3%). 40(44.4%) patients had a significant surgical history. The majority of the patients in our study had diabetes(66.7%).

Table 1: Demographic of the patients

Variables	Categories	Results (n=90)
Age (years)	<50	10 (11.1%)
	50-70	50 (55.6%)
	>70	30 (33.3%)
Alcohol	Yes	25 (27.8%)
	No	65 (72.2%)
Smoking	Yes	60 (66.7%)
	No	30 (33.3%)
BMI	>30	75 (83.3%)
	<30	15 (16.7%)
Surgical history	Yes	40 (44.4%)
	No	50 (55.6%)
Comorbities	Diabetes	60 (66.7%)
	Hypertension	5 (5.6%)
	BPH	6 (6.7%)
	Cirrhosis/hepatitis	12 (13.3%)
	Renal failure	4 (4.4%)
	COPD	2 (2.2%)
	Cardiovascular Disease	3 (3.3%)

59% of the patients in our study had an indirect hernia (Figure 1).

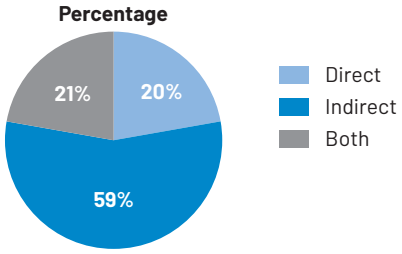

Figure 1: Types of hernia

Table 2 shows that 60(66.7%) patients were provided with scrotal among whom, 30(50%) patients were given scrotal support immediately after the surgery. Overall 30(33.3%) patients developed scrotal edema. 20 (30.8%) of the patients developed scrotal hernia on the 2nd Post-Operative day.

Table 2: Shows the data related to scrotal support

Variables	Categories	Results (n=90)
Scrotal Support	Yes	60 (66.7%)
	No	30 (33.3%)
The time of application of scrotal support if given	Immediately after the surgery	30 (50%)
	1st post-operative day	18 (30%)
	2nd Post-operative day	12 (20%)
Did scrotal edema develop	Yes	30 (33.3%)
	No	60 (66.7%)
When did the scrotal edema develop	1st Post-Operative day	12 (18.5%)
	2nd Post-Operative day	20 (30.8%)
	3rd Post-Operative day	10 (15.4%)

Table 3 shows that 25(27.8%) patients who were not given

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scrotal support developed scrotal edema however only 1(1.1%) who were provided scrotal support immediately after the surgery developed scrotal edema. The association between scrotal support and scrotal edema was statistically significant(p<0.01).

Table 3: Shows the relationship between scrotal support and scrotal edema

Variables	Categories	Scrotal Edema		p-value
		Yes	No	
Scrotal Support	Immediately after the surgery	1(1.1%)	25(27.8%)	< 0.01
	1st postoperative day	2(2.2%)	15(16.7%)	
	2nd Post-operative day	2(2.2%)	15(16.7%)	
	Not given	25(27.8%)	5(5.6%)	

DISCUSSION

Among all the hernias, an inguinal hernia is the most prevalent one and the acceptable treatment option for it is its operative repair [2]. This operation is one of the most common operations and it is also the young training surgeon's treatment of choice. As the complications are quite common with every surgical procedure, the complications of hernia repair include infection, recurrence, bleeding, nerve damage, and scrotal swelling [2, 11]. In our study, we studied the complication of scrotal swelling and edema and how it is affected by scrotal support. Among all the complications, the penoscrotal hematoma is a quite well-documented complication of the surgical repair of an inguinal hernia however it is quite rare to have a massive penoscrotal hematoma that needs surgical intervention [2, 12]. In terms of scrotal edema, it was noticed that the edema was absent in those patients who were given scrotal support that can give self-compression of the scrotal compartment within the abdominal wall [13]. Joseph and O'Boyle findings was consistent with the finding of our study as well. Among the complications, the most common one is penoscrotal hematoma which usually responds to a conservative approach in terms of scrotal support and rest. In complicated cases, the ultrasound is used for the evaluation of penoscrotal hematoma or swelling to directly confirm the diagnosis [13]. However, in patients with massive hematoma, the diagnosis on clinical grounds is obvious and does not necessarily warrant ultrasound. In patients with scrotal or unresolving hematoma, surgical drainage might be required. Massive penoscrotal hematoma is quite common among the patients diagnosed with bleeding diseases like haemophilia where a small trauma can trigger the bleeding in scrotum [14]. In a study by Tanimola *et al.*, 43.1% showed scrotal edema [15]. The scrotal support provided in a study leads to 52.7% patients satisfaction in the same study. This was similar to our study as in our study as well, only 1.1% patients developed scrotal edema who were provided scrotal support immediately after the surgery. The scrotal support is used to prevent the stretching of the spermatic cord and the structures associated with it such as vessels and testes. The scrotal support does it by providing antigravity support and compressing the layers of the scrotum to reduce the risk of hematoma and edema of the scrotum [16]. It can be done by utilizing simple V-shaped undergarments and the need for the coconut bandage is not needed anymore. Several techniques can be used to provide scrotal support [17, 18]. The demographic findings of this study were similar to our study [19]. It also shows that the scrotal hematoma and edema need to be managed appropriately or else worsen the prognosis [20]. In our study, the recurrence rate was zero for the inguinal hernia which was consistent with other studies as well [21, 22]. The major limitation of our study was that it was a single-centered study due to which a small sample size was collected and limited variables were analyzed.

CONCLUSIONS

Our study concludes that scrotal support has a positive role in preventing scrotal edema in our study. Surgeons must consider it after the procedure of surgery for inguinal hernia.

Authors Contribution

Conceptualization: AN, MG
Methodology: KF, AE, AN, MA
Formal analysis: IJ, RW
Writing-review and editing: MH, AN, MG, MA

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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