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ORIGINAL ARTICLE

The Effect of Intravenous Tranexamic Acid on Reduction of Seroma After Para-Umbilical Mesh Hernioplasty

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ABSTRACT

Objective: Paraumbilical hernia is the second most common presentation in adults which is managed surgically. Seroma formation is one of the major complications of mesh hernioplasty. Different methods are used for prevention of seroma post operatively. to determine the effect of tranexamic acid in seroma formation in our population as only few international studies are available.

Methodology: It was a case control trail conducted in department of general surgery Gulab Devi Hospital Lahore. In our study 40 patients were included through randomized sampling having paraumbilical hernia undergoing mesh hernioplasty. These patients were divided in two groups. In group 1 patient received Injection Tranexamic acid 1gm pre operatively while in group 2 inj tranexamic acid was not given.

Results: Seroma formation after drain removal was seen in 04(10%) patients only. Out of these 04 patients 01(25%) patient belonged to group 1 while 03(75%) patient were in group 2 which was proved statistically (p-value 0.004). Patients with increased BMI had seroma (26.7 ± 2.1 kg/m^2 vs 25.7 ± 1.8 kg/m^2) but it was not statically proved (p-value 0.84). Patients with seroma had mean weight of 89 ± 10.7 kg while patients with no seroma had mean weight of 74 ± 11.5 kg which was statistically proved (p-value 0.018).

Conclusion:

Keywords: Paraumbilical hernia, Seroma, Tranexamic acid

Authors' Contribution:
[1,2]Conception; Literature research; manuscript design and drafting; [2,3] Critical analysis and manuscript review; [5,6] Data analysis; Manuscript Editing.

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Introduction

The term hernia is derived from ancient Latin word hernios mean 'protruded viscus'. Hernia is an abnormal protrusion of a viscus or a part of viscus through the weak point in cavity that contains it.[1] Hernia most commonly occurs in inguinal region, femoral region, umbilical and paraumbilical regions. Para-umbilical hernia is second most common hernia in adults. It is 6-14% of all abdominal wall hernia.[2]

Clinically hernias are classified into reducible hernia and irreducible hernia.[3] Obstructed hernia is an irreducible hernia with obstruction of bowel segment protruded in hernia cavity, but blood supply to bowel is not interfered.[4] In strangulated hernia blood supply of contents is also compromised.[5]

A para-umbilical or umbilical hernia is a defect in the anterior abdominal wall with close approximation to umbilicus.[6] The defect can be congenital or acquired. Causes of acquired hernia includes diseases increasing intra-abdominal pressure (ascites, pregnancy), obesity, chronic abdominal distention, smoking and heavy weight lifting[7] or abdominal trauma. Congenital umbilical hernias usually close gradually within first two to five years.[8] If it persists then surgical repair is required. To repair umbilical or para-umbilical hernia different surgical techniques are used. The procedure required usually depends upon the size of defect. If it is of 1cm primary repair with polypropylene 1 is done. If it is of 2cm mayo's repair is performed in which double breasting with upper and lower flaps is done. If it is of more than 2cm mesh is placed.[9]

Mesh hernioplasty has further subtypes named onlay in which mesh is placed above the rectus sheath, sublay in which mesh is placed between posterior rectus sheath and muscles and inlay in which mesh is placed between muscles and abdominal contents.[10] Laparoscopic mesh repair is done for umbilical hernia by placing a mesh either intraperitoneal onlay mesh (IPOM) or preperitoneal under the defect.[11] Para-umbilical hernia repair with mesh have many complications. Complications included seroma (6-21%), hematoma 7%, surgical site infection (4-19%) and bowel injuries (6%).[12]

Seroma is accumulation of clear fluid at the site of surgery. To prevent from infection repeated aspiration is required for large seromas. To prevent seroma many methods are used, that includes proper surgical technique, use of drain, compression dressing and use of sealant.[13]

Drains are used for drainage of fluid to prevent fluid accumulation (18.5%). A multi-channel drain with negative pressure is used in para-umbilical or umbilical mesh hernioplasty.[14] Fibrin glue is used as a sealant and prevent seroma formation (15.9%).[15] Sclerotherapy also reduces seroma formation (2.7%). It involves filling of cavity with an irritating substance, which induce fibrotic response to seal the dead space. Most commonly used sclerosing agents include doxycycline, bleomycin and talc. Sharp or ultrasonic dissection also reduces seroma formation (15.4%).[16]

Tranexamic acid is used intraoperatively and postoperatively to control bleeding in major surgeries. It also helps in reducing seroma formation (37%).[17] Tranexamic acid is a formed from amino acid lysine. It acts as antifibrionolytic agent. This decreases the conversion of plasminogen to plasmin and prevent fibrin degradation and preserve fibrin matrix structure.[18]

The objective of this study was to determine the effect of tranexamic acid in seroma formation in our population as only few international studies are available. This study will help in reducing hospital stay and morbidity in patients undergoing mesh hernioplasty for para umbilical hernia.

Methodology

It was case control study conducted at the surgical ward of Gulab Devi Teaching Hospital, Lahore, from January 2022 to December 2022. A total of 40 patients with paraubilical hernia admitted for mesh hernioplasty were included in study and were divided in two equal groups by lottery method. Patients in group 1 had injection tranexamic acid 1gm 10 minutes before incision while patients in group 2 were without injection tranexamic acid. Inclusion criteria were patients with para umbilical hernia having mesh hernioplasty. Exclusion criteria were patients with chronic liver disease, BMI more than 35 kg/m^2 and recurrent or incisional paraumbilical hernia. Post operative drain output per day, day of drain removal, hospital stay and seroma formation after removal of drain were documented. Data was collected with consent of patient and permission of ethical committee. Data was collected on questionnaire designed specifically for the study being conducted. All data was statistically analyzed by using SPSS 23.0. Descriptive

statistics like mean, median, mode and standard deviation were applied. Frequency was studied by statistical test. Qualitative data was presented in form of graphs and charts. Quantitative data was presented in form of tables.

Results

A total of 40 patients with diagnosis of para umbilical hernia having mesh repair were included in this study. They were divided in two groups of 20 patients in each group. Patients in group 1 had injection tranexamic acid 1gm 10 minutes before incision while in group 2 patients no tranexamic acid was given pre operatively.

In group 1 there were 18(90%) females and 02(10%) males while in group 2 there were 19 (95%) females and only one (05%) patient was male. In group 1 mean weight of patients was 76.85 ± 14.75 kg while in group 2 was 74.25 ± 9.19 kg. In group 1 mean BMI of patients was 25.7 ± 2.14 kg/m^2 while in group 2 was 25.9 ± 1.64 kg/m^2. Mean age in group 1 patients was 47.2 ± 7.68 years while in group 2 was 46.3 ± 7.30 years.

In group 1 patients drain was removed earlier as compared to group 2. Mean duration for surgical removal was 4 ± 0.8 days while in group 2 was 5.9 ± 1.16 days. Drain output was less in group 1 patients as compared to group 2 patients. Mean drain output from day 1 to day 5 in group 1 and group 2 was 72 ± 19 ml vs 88.5 ± 24.1 ml, 42.5 ± 10.6 ml vs 57 ± 14.1 ml, 20 ± 10.7 ml vs 40 ± 17.3 ml, 10.7 ± 9.1 ml vs 26.5 ± 14.2 ml and 06 ± 5.4 ml vs 18.3 ± 13.3 ml respectively. In group 1 no patients had drain more than 05 days while in group 2 patients mean drain out put on day 6 to 8 was 12.7 ± 10 ml, 6 ± 5.4 ml and 0 ml respectively.

Seroma formation after drain removal was seen in 04(10%) patients only. Out of these 04 patients 01(25%) patient belonged to group 1 while 03(75%) patient were in group 2 which was proved statistically (p-value 0.004). Patients with increased BMI and weight had seroma (Table 1)

Table 1: Factors Affecting Seroma Formation

Factors		Seroma		P-Value
		YES	NO	
Tranexamic Acid	Yes	01	19	0.004
	No	03	17	
Weight (Kg)		89 ± 10.7	74 ± 11.5	0.018
BMI (kg/m^2)		26.7 ± 2.1	25.7 ± 1.8	0.84
Number of days drain placed		6.5 ± 1.2	4.7 ± 1.3	0.69

Discussion

Management of paraumbilical hernia depends upon the size of hernia. Hernia defect more than 2cm is usually managed by mesh hernioplasty. Seroma formation is the most common complication in mesh hernioplasty for paraumbilical hernia.[12] This seroma formation may lead to wound and mesh infection. This results in increase in hospitalization. According to our study if injection tranexamic acid is given pre operatively it decreases the incidence of seroma formation. These results were statistically proven. These results are similar to some national & international studies where tranexamic acid resulted in decrease in incidence of seroma formation.[19-20]

Surgical drains are placed for prevention of seroma. These drains are removed when the drain output decreases to 10ml/day. In our study drains were removed earlier in patients having tranexamic acid as compared to another group. This resulted in reduced hospital stay. Similarly drain output/day was less in patients with tranexamic acid as compared to another group. These results are similar to international studies.

Obesity is the other factor responsible for seroma formation after mesh hernioplasty for para umbilical hernia. In our study seroma was seen in patients

with more weight and BMI. These results are similar to other national and international studies.[20]

Our study was conducted at single institute and sample size was small. Further multicenter with larger sample size studies and systemic reviews on national and international levels are required to make this finding as a normal routine practice during paraumbilical hernia mesh hernioplasty. This practice will be a great addition to reduce morbidity, hospital stay and cost to the healthcare systems.

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