

Original research article

Factors Affecting Viability of Contents in Complicated Hernia

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Abstract

Background: Complicated external hernia is common and serious; no definitive clinical criterion is able to differentiate strangulation or infarction. Surgeons therefore, have difficulty in choosing the appropriate treatment (manual reduction or emergent operation) and determining the ideal approach for these cases. This study was aimed at identifying the risk factors for developing complicated hernias and its predictive factors.

Methods: This is a prospective observational study of 53 cases with clinical diagnosis of all types and varieties of irreducible hernia. The patient information regarding type of hernia, time duration before occurrence of irreducibility, duration of irreducibility, type of complication of irreducible hernia and presenting symptoms were collected and analysis was done by SPSS software version 2.

Results: Majority of the cases of irreducible hernias were males (77%) seen in 5th and 6th decade (47.2%). Contents of hernia and duration of irreducibility were significantly associated with viability of contents of hernia. Majority of the hernias with bowel as content and those with increased duration to irreducibility were non-viable. The Sensitivity and Specificity of ultrasound viability were found to be 50%, and 100% respectively in detecting the viability of hernia.

Conclusions: The factors affecting the viability of contents of hernia in our study are mainly contents of hernia and duration of irreducibility. Bowel as the content of hernia and increased duration to irreducibility poses higher risk for viability of contents of hernia.

Keywords: Irreducible hernia, Complicated hernia, Viability, Hernia.

Introduction

Hernias are defined as the protrusion of part or whole the viscus and its content. A complicated hernia is any hernia that has lost its benign nature and whose treatment is no longer simple.¹ Life-threatening complications such as strangulation pose a highly morbid and mortal burden on the outcome of complicated hernias. Yet no clear-cut criteria are established for the prediction of these life-threatening complications and their management. This has led to a number of studies being undertaken.

The lifetime risk of undergoing a hernia operation is 27% for men and 3% for women.¹ Strangulated external inguinal hernias are the second most common cause of bowel obstruction and are the most common cause for abdominal surgery in patients with bowel obstruction who have no history of previous laparotomy.²

Compared to uncomplicated hernias, the treatment of which has made great progress in modern times, complicated hernias have been relatively neglected for fear that their treatment may cause even greater risk to the patient than the hernia itself.³

The outcome of complicated hernias is affected by the time between the onset of symptoms and surgery. Patient delays, in presenting at the hospital and misdiagnosis by physicians are both possible explanations for the delay.⁴

By handling the patients correctly and tending to their needs, complications such as intestinal necrosis and resection can be avoided and postsurgical complications could be minimized, as the morbidity following a surgical procedure does not only bring with it a social burden but also a financial burden for the patient and the caregiver.

Although complicated external hernia is common and serious, no definitive clinical criterion is able to differentiate strangulation or infarction. Surgeons therefore, have difficulty in choosing the appropriate treatment (manual reduction or emergent operation) and determining the ideal approach for these cases. This study was aimed at identifying the risk factors for developing complicated hernias and its predictive factors.

MATERIALS AND METHODS

We have conducted a prospective observational study of 53 cases in our institute between May 2019 to June 2021. All age groups admitted with clinical diagnosis of all types and varieties of irreducible hernia were included in this study. After pre-operative stabilization and complete preoperative workup, patients were taken for emergency surgery within 3 hours. The patient information regarding type of hernia, time duration before occurrence of irreducibility (duration of hernia is time duration from occurrence of hernia till onset of irreducibility noticed by the patient), duration of irreducibility (duration of irreducibility was defined as the time duration from onset of irreducibility noticed by patient till the patient was taken for surgery), type of complication of irreducible hernia, presenting symptoms (i.e. irreducible swelling, pain, vomiting, constipation, fever). The findings of CBC, erect X-ray Abdomen and locoregional ultrasound were recorded. Intraoperatively cause of irreducibility, contents of sac, presence of toxic fluid and viability of content were recorded. Non-viable bowel was defined as lusterless, aperistaltic, black to greenish discoloration, absent mesenteric pulsations and no color change with warm saline mops. The Data obtained included demographic characteristics, presentation, operative findings and outcome. After data collection, analysis was done with help of by SPSS software version 21.

RESULTS

Patients with complicated hernia, meeting the study criteria were 53 cases. The mean age of our study participants was 49.7 years with SD of 15.5 years with age range of 2 - 78

years. Majority of the cases of irreducible hernias were seen in 5th and 6th decade (47.2%). The majority cases were males (77%). The patients were grouped into two based on viability of contents of hernia. These two groups were comparable with respect to age and gender ($p>0.05$). (Table 1)

Table 1: Demographic variables in our study

Variables		Non-viable content (n=10)	Viable content (n=43)	P value
Age	< 20 years	0	2 (4.7%)	0.147
	21-40 years	2 (20%)	7 (16.3%)	
	41-60 years	3 (30%)	26 (60.5%)	
	>61 years	5 (50%)	8 (18.6%)	
Gender	Males	7 (70%)	34 (79.1%)	0.677
	Females	3 (30%)	9 (20.9%)	

Table 2 shows the factors affecting the viability of contents of hernia. Contents of hernia and duration of irreducibility were significantly associated with viability of contents of hernia. Majority of the hernias with bowel as content and those with increased duration to irreducibility were non-viable and this was statistically significant when chi-square test was applied ($p<0.05$).

Table 2: Factors affecting the viability of contents of hernia in our study

Factors affecting the viability		Non-viable content	Viable content	P value
Site of Hernia	Inguinal hernia	6 (60%)	29 (67.4%)	0.710
	Incisional hernia	4 (40%)	8 (18.6%)	
	Femoral hernia	0	2 (4.7%)	
	Epigastric hernia	0	1 (2.3%)	
	Paraumbilical hernia	0	2 (4.7%)	
	Umbilical hernia	0	1 (2.3%)	
Contents of Hernia	Appendix	0	2 (4.7%)	0.026
	Only Bowel	8 (80%)	14 (32.6%)	
	Bowel with Omentum	2 (20%)	12 (27.9%)	
	Only Omentum	0	15 (34.9%)	
Duration of hernia	< 1 year	3 (30%)	13 (30.2%)	0.625
	1-5 years	4 (40%)	21 (48.8%)	
	6- 10 years	3 (30%)	6 (14%)	
	>10 years	0	3 (7%)	
Cause of Irreducibility	Constriction neck of hernia sac	7 (70%)	22 (51.2%)	0.281
	Adhesions	3 (30%)	21 (48.8%)	
Duration of irreducibility	<12 hours	4 (40%)	23 (53.5%)	0.045
	12-24hours	1 (10%)	12 (27.9%)	
	24- 48 hours	1 (10%)	5 (11.6%)	
	>48 hours	4 (40%)	3 (7%)	
WBC count	<4,000	1 (10%)	2 (4.7%)	0.210
	4,000-11,000	5 (50%)	33 (76.7%)	
	>11,000	4 (40%)	8 (18.6%)	

The Sensitivity and Specificity of ultrasound viability were found to be 50%, and 100% respectively with positive and negative predictive value of 89.6% and 100%. The accuracy of ultrasound to detect viability of hernia is 90.6%.

Table 3: Comparison of ultrasound viability with intraoperative viability

Viability	Intraoperative viability		Total	p-value
	Non-viable content	Viable content		
Ultrasound viability				
Non-viable content	5	0	5	<0.001
Viable content	5	43	48	
Total	10	43	53	

DISCUSSION

Bekoe, in his prospective review of 118 patients with incarceration/strangulation, stated that he could find “no definite criterion” to differentiate incarcerated hernia with viable contents from that of nonviable contents.⁵

From the observed data, no significant association was found between age, gender, type of hernia, duration of hernia and cause of irreducibility and viability of contents. The literature states a high incidence of strangulation in femoral hernia, no strangulation of contents was noted in this study probable explanation would be the early presentation of irreducible femoral hernia (< 12 hours).⁶ Duration of hernia is a significant risk factor which is a predictor of complications in a groin hernia. In general, hernias of short duration appear to strangulate more commonly than longstanding ones. The explanation lies in the relative rigidity of the hernial ring when a hernia appears first and its gradual stretching and laxity as time passes. Gallegos et al. found the rate of increase of cumulative probability of strangulation in a hernia to be the greatest in the first 3 months of its presence.⁷ In the present study, 5.7% of cases with duration of hernia less than 1 year had necrosis of content while 5.7% of cases with duration of hernia 6- 10 years had necrosis. None of the cases with duration of more than 10 years required resection of content.

The time elapsed between the onset of symptoms and the presentation at hospital also affects the risk of complications. Alvarez et al. found that there were significantly more complications in patients who came to the hospital more than 48 h after symptom onset. In our study irreducibility of duration more than 48 hours had significant co relation with necrosis as 57.1% cases had necrosis of content which required resection and 42.9% cases had viable content though presentation after 48 hours. Hogan et al.⁸ found that duration of >12 hours is an independent risk factor for intestinal necrosis and Tanaka et al.⁴ had similar opinion. Xianzhi et al.⁹ found that duration of > 26 hours is a risk factor for intestinal necrosis.

CONCLUSION:

The factors affecting the viability of contents of hernia in our study are mainly contents of hernia and duration of irreducibility. Bowel as the content of hernia and increased duration to irreducibility poses higher risk for viability of contents of hernia.

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