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Research Article

Outcomes And Complications in Emergency Inguinal Hernia Repair During COVID-19 Pandemic: In Earlier Reported Patients

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ABSTRACT

Background: In India, obstructed hernias are the most typical reason for intestinal blockage. About 5–15% of people with inguinal hernias require emergency surgery as a result of complications. In present study we aimed to study outcome and complications in emergency inguinal hernia repair during the COVID-19 pandemic at our centre.

Material And Methods: We studied patients who visited our facility with obstructed, strangulated, or incarcerated inguinal hernia that required surgery or treatment during the COVID-19 epidemic between March 2020 and March 2021. All the clinical data were statistically analysed.

Results: During the study period total 41 patients underwent surgery for emergency hernia repair at our hospital within 6 to 24 hours of onset of symptoms. All patients were male. Mean age of patients was 49.3 ± 11.2 years, mean BMI was 25.8± 4.2 kg/m2 and 65.8 % patients were ASA grade II. Common co-morbidities noted were obesity (24.4%), hypertension (31.7%) and diabetes (29.3%) respectively. Intraoperatively, indirect inguinal hernia (70.7%), left sided hernia (60.9%), irreducible hernia (46.3%) with small intestine content (63.4%) were most common findings. Hernioplasty with mesh repair was most common procedure, done in 70.7% patients. Common complications noted were wound infection (12.2%), seroma (7.3%), post-operative hematoma (2.4%) and respiratory disturbances (2.4%). No paraesthesia, mortality was noted in present study.

Conclusion: During the COVID-19 pandemic in emergency inguinal hernia repair has a good outcome in patients reported earlier, immediately operated with mesh repair. Mesh placement in emergency inguinal hernia repair appear to be a good option with acceptable wound infection rate and fewer recurrences.

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INTRODUCTION

Acute Respiratory Syndrome Corona Virus 2 (SARS-CoV-2) is a vastly spreadable respiratory infection caused by a novel virus, Corona virus 2019 (COVID-19). (RETAINER Collaborative Group, 2021) The COVID-19 outbreak was deemed a pandemic by the World Health Organization (WHO) on March 11, 2020. (Fan Wu and Su Zhao et al., 2020) Fever, coughing, chest pain, and, in more severe cases, dyspnea and bilateral lung infiltration are all signs of this viral pneumonia. (Ben Hu and Hua Guo *et al*., 2021) The tremendous contagious potential of the virus caused hospitals all over the world to swiftly become overrun with the number of sick patients and their need for respiratory support. Numerous nations subsequently proclaimed states of emergency and advised their populations to remain at home, while hospitals were advised to postpone elective surgery. (COVIDSurg Collaborative, 2020; Mary Elizabeth Brindle, 2020; C Stabilini and B East *et al.,* 2020) These elements, along with the concern over COVID-19, resulted in fewer visits but a higher complication rate for emergency surgeries such those for acute appendicitis. (Brad Boserup and Mark McKenney *et al.,* 2020; Marie Burgard and Floryn Cherbanyk *et al.,* 2021).

Hernias are among the oldest recorded afflictions of humans, with more than 20 million patients annually, inguinal hernia repair is one of the most often performed surgical procedures worldwide. The hernia becomes incarcerated when the it traps the hernia's contents, preventing them from returning to their initial placement the consequences of being imprisoned, which is primarily discomfort and pain, depending on the hernia's pathological impacts on the confined person's bodily function part. If the blood flow to the trapped component is stopped, the part becomes strangulated. (HerniaSurge Group, 2018). A significant contributor to the emergence of complex Inguinal hernia is the interval between the onset of symptoms and increased hospital admission. (Necmi Kurt and Mustafa Oncel *et al.,* 2003; B-J Ge and Q Huang *et al.,* 2010)

As the COVID-19 pandemic spread, incarcerated hernias and other abdominal problems that required hospital hospitalization dropped considerably. (Caroline T Dong and Anna Liveris *et al.,* 2021; D. L. Lima and X. Pereira *et al.,* 2020) While some papers noted a significant decline in emergency operations and the incidence of hernias in prisoners, others noted a rise in these conditions throughout the pandemic. (Ahmet Surek and Sina Ferahman *et al.,* 2021; Francesk Mulita, Maria Sotiropoulou *et al.,* 2021). Recurrence rate, complication rate, ease of surgery for trainee surgeons, low cost, and recovery time are the standards by which a successful hernia operation is measured. Use of permanent mesh is still generally safe in the case of bowel imprisonment if there is no ischemia and no need for resection. (Takatsugu Oida and Atsushi Kawasaki *et al.,* 2012) Prior to recent publications, it was thought that the use of mesh in complex hernias with blockage would further raise the risk of infections. However, the mesh is safe and does not increase infection risk. (N W Scott and K McCormack *et al.,* 2002) In the current study, we sought to examine the results and side effects of urgent inguinal hernia repair to see if, the COVID-19 pandemic had any effect on emergency inguinal hernia surgeries.

MATERIAL AND METHODS

This study was conducted in the department of Surgery at Sri Aurobindo Medical College & PG Institute. Forty-one patients were operated & included in the study. Who visited our facility with obstructed, strangulated, or incarcerated inguinal hernia that required surgery or treatment

during the COVID-19 epidemic between March 2020 and March 2021.The time duration between the onset of symptoms and presentation to hospital <6hours, 6-24 hours and >24 hours. The variables include the demographics of patients age, BMI kg/m2, comorbidities, type of hernia, site of hernia, main contents of hernia, surgical procedure and postoperative complications. Physical examination and history were taken and the written informed consent also obtained from all of the inguinal hernia patients. Laboratory and radiological investigations such as Hb%, DC, TLC, RBS, RFT, LFT, ESR, ECG and chest X-ray were done in all patients. Ultrasound abdomen, X-ray abdomen erect, 2D ECHO were done whenever needed. Cases with inguinal hernias that had signs of obstruction and inability to reduce the hernia are taken up for emergency surgical intervention within 8-10 hours. Emergency preparation of the patient was done by initial resuscitation of the patient with crystalloids to maintain haemodynamic stability, Nasogastric tube aspiration was done and bladder catheterization was done. All cases were performed under general anaesthesia. Various surgical procedures such as hernia repair with mesh fixation, herniorrhaphy along with omentectomy, herniorrhaphy along with resection and anastomosis were done as needed. All patients received standard care in the peri-operative period. Antibiotics and chest physiotherapy was given. The cord was routinely checked until the patient was discharged.

INCLUSION CRITERIA

- The ASA grade I, II and III.
- Patients above 18 yrs. of age with obstructed/
- Strangulated/ incarcerated inguinal hernia.

EXCLUSION CRITERIA

- Patients unfit for surgery
- Patients not prepared to participate
- Patients with normal reducible inguinal hernia

STATISTICAL ANALYSIS

The data were collected and entered in MS excel 2019. Data were presented as frequency table. The one sample Kolmogorov-Smirnov test will employ to determine the normal distribution. Non-normally distributed data were analyzed using non parametric tests. Descriptive statistics will be calculated for quantitative variable (mean±SD) and qualitative variables (frequency and percentage). All data were statistical analyzed by using SPSS (IBM, Version 27.0. Armonk, NY: IBM Corp).

RESULT

During the study period total 41 patients underwent surgery for emergency hernia repair at our hospital within 6 to 24 hours of onset of symptoms. All patients were male. The mean age of patients was 49.3 ± 11.2 years, mean BMI was 25.8± 4.2 kg/m2and 6 (14.7%) patients were ASA grade I, 27 (65.8%) patients were ASA grade II and 8 (19.5%) patients were ASA grade III. Common co-morbidities noted were obesity 10 (24.4%), hypertension 13 (31.7%) and diabetes 12 (29.3%), Smoking 11 (26.8%) and Hypoproteinemia, Bronchial asthma, Cardiopathy 6 (14.6%),5 (12.1%) and 4 (9.7%) respectively, showed in table1.

Table 1: Demographical Characteristics of Patients

Characteristics	Number of patients (n=41)
Age (Mean± SD in years)	49.3 ± 11.2
BMI (Mean± SD in kg/m2)	25.8 ± 4.2
ASA grade	
I	6 (14.7%)
II	27 (65.8%)

III	8 (19.5%)
Comorbidities	
Smoking	11 (26.8%)
Diabetes	12 (29.3%)
Obesity	10 (24.4%)
Hypertension	13(31.7%)
Hypoproteinemia	6 (14.6%)
Bronchial asthma	5 (12.1%)
Cardiopathy	4 (9.7%)
ASA: American Society of Anaesthesiologists'	

Intraoperatively, 29 (70.7%) indirect inguinal hernia, 8 (19.6%) direct inguinal hernia and 4 (9.7%) mixed. left sided hernia 16 (39.1%) right sided hernia 25 (60.9%), irreducible hernia 19 (46.4%) Obstructed inguinal hernia 11 (26.8) and strangulated inguinal 11 (26.8%) hernia with main contents of hernia omentum 11 (26.8%), colon 3 (7.3%) and small intestine content 27 (65.8) were most common findings. (Table.2) The mean duration of operation was 75 ±23.1 (min).

Table 2: Operative finding in Emergency Inguinal Hernia Repair patients

Characteristics	Number of patients (n=41)
Time duration between the onset of symptoms and presentation to Hospital	
< 6hours	24 (58.5%)
6-24 hours	11 (26.8%)
>24 hours	6 (14.7%)
Type of hernia	
Direct inguinal hernia	8 (19.6%)
Indirect inguinal hernia	29 (70.7%)
Mixed	4 (9.7%)
Site of hernia	
Right	16 (39.1%)
Left	25 (60.9%)
Type of hernia	
Strangulated inguinal hernia	11 (26.8%)
Obstructed inguinal hernia	11 (26.8)
Irreducible inguinal hernia	19 (46.4%)
Main contents of hernia	
Omentum	11 (26.8%)
Intestine	27 (65.8)
Colon	3 (7.3%)

In table 3 we found the surgical procedure hernioplasty with mesh repair was most common procedure, done in 29 (70.7%) patients, adhesiolysis with hernioplasty with mesh repair 6 (14.7%), omentectomy and hernioplasty with mesh repair 4 (9.8%) and bowel resection with end-to-end anastomosis and hernioplasty with mesh repair were 2 (4.8%).

Table 3: Types of Surgical Procedure

Characteristics	Number of patients
Hernioplasty with mesh repair	29 (70.7%)
Adhesiolysis with hernioplasty with mesh repair	6 (14.7%)
Omentectomy and hernioplasty with mesh repair	4 (9.8%)
Bowel resection, end to end anastomosis and hernioplasty with mesh repair	2 (4.8%)

Post-operative common complications were noted wound infection 5 (12.1%), seroma 3 (7.3%), post-operative hematoma, respiratory disturbances and paralytic ileus were 1 (2.4). No paraesthesia, mortality was showed in Table 4.

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Table 4: Postoperative Surgical Complications

Characteristics	Number of patients
Wound infection	5 (12.1%)
Seroma	3 (7.3%)
Post-operative hematoma	1 (2.4%)
Respiratory disturbances	1 (2.4%)
Paralytic ileus	1 (2.4%)

DISCUSSION

Inguinal hernia repair, also known as herniorrhaphy or hernioplasty, is one of the most common surgical procedures worldwide. While incarcerated inguinal hernia manifests as an acutely irreducible inguinal mass, which requires timely surgery because it may eventuate in the strangulation and gangrene of the intestine; it represents between 5 and 15% of groin hernial repairs. (Ivan Pesić and Aleksandar Karanikolić, *et al*., 2012; Darin Lohsiriwat and Varut Lohsiriwat 2013) During the COVID-19 pandemic had any effect on inguinal hernia surgeries, we found that there was a significant increase in the rate of incarceration seriously. In present study total 41 patients underwent surgery for emergency hernia repair at our hospital within 6 to 24 hours of onset of symptoms during COVID-19 pandemic. The COVID-19 pandemic had indispensable effects on surgical treatments as in every field in our country. In our study, we found that mean age of patients was 49.3 ± 11.2 years, mean BMI was 25.8± 4.2 kg/m2 and 65.8 % patients were ASA grade II. and all patients were male. (Hariprasad and Teerthanath Srinivas, 2017) conducted a clinical study on the complicated presentations of groin hernias and reported that the incidence was highest in the age groups between 44-53 years whereas in the study. (Gaddam Padmasree, 2019) Similar findings were seen in this present study. Incidence of acute groin hernias was reported to be higher in males than females, 88.5% in males and 11.5% in females. (Gaddam Padmasree, 2019), the incidence was highest in 54-63 years age group. In current study the time duration between the onset of symptoms and presentation to hospital was found< 6 hours (58.5%), 6-24 hours (26.8%) and >24 hours (14.7%). Common co-morbidities were found, including hypertension, diabetes mellitus, bronchial asthma, COPD, enlarged prostate, and constipation. These factors are responsible for the chronic and intermittent. An increase in intra-abdominal pressure causes a hernia and complicated hernias to occur more frequently. In almost all cases, an incarcerated/strangulated groyne hernia can be diagnosed just with a clinical examination. Recent studies suggest that mesh implantation in emergency inguinal hernia repair is a good alternative, with a lower risk of wound infection and fewer recurrences than non-mesh repair. (Hassen Hentati and Wajih Dougaz *et al*., 2014: Bamidele Johnson Alegbeleye, 2020) Bowel resection rates were 12.8% which is considerably less than the estimated 21% and 15.9% reported in earlier investigations. (O Ayandipo and O Afuwape *et al*., 2015; Joseph B Mabula and Phillipo L Chalya, 2012) It suggests that patients presenting relatively earlier now than in the preceding decades. Additionally, the need for bowel resection is related to the time interval between the onset of acute symptoms and hospital presentation. The two most common post-operative complications are seroma development and wound infection. Previous study noted wound infection and seroma formation (33%) and 13% by (R Chinnapan and C Arunkumar 2020) (10%) and 15.38% (Shahbaz Habib Faridi and M. Aslam *et al*., 2016) and (5.3%) and 12.7% by (Ajaz Ahmad Rather and Altaf Malik, 2018) In our study, 7.3% of patients had seroma development and 12.1% patients had wound infections. And 2.4% patients were found post-operative hematoma, respiratory disturbances and paralytic ileus. There is a higher risk of post-operative scrotalo edema and a higher frequency of

wound infection in patients with large irreducible hernia sacs, such as sliding hernias, those presenting late. Placement of drains into the mesh site has indicated that decreased wound infection and oedema. (Shahbaz Habib Faridi and M. Aslam *et al*., 2016; Cuihong Jin and Yingmo Shen *et al.,* 2019) (70.7%) indirect inguinal hernia and 8 (19.6%) direct inguinal hernia were found in the current study. A strangulated hernia refers to an incarcerated hernia in which the entrance to the hernia sac or "neck" is constricted, limiting blood supply to the sac contents and ultimately resulting in tissue necrosis, bowel infarction, and perforation. This condition is a life-threatening emergency requiring immediate surgery. (Necmi Kurt and Mustafa Oncel *et al.,* 2003) In our finding, some factors were related with overall complications in emergency hernia repair, namely age >60 years, duration of incarceration ≥10 h, ASA grade ≥II, cardiopathy, bronchial asthma, indirect inguinal hernia, and strangulation.

CONCLUSION

All medical operations must be performed during the COVID-19 pandemic with complete knowledge of the patient's condition, including COVID-19 infection. To reduce the danger of cross contamination to medical personnel during surgery, suitable precautions must also be implemented. As a result, our study found that patients who underwent urgent mesh surgery after reporting an emergency inguinal hernia had an excellent prognosis. With an acceptable rate of wound infection and fewer recurrences, mesh implantation in emergency inguinal hernia repair appears to be a promising alternative. The COVID-19 epidemic resulted in a decline in both elective and emergency hernia surgery but a marked rise in incarceration rates. Our study's weaknesses are its limited sample size and retrospective approach. It will be useful to reveal a clearer surgical planning calendar in order to reduce our rate of encountering complicated cases in pandemic situations such as COVID-19.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest

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