ORIGINAL ARTICLE

Single-centre experience of emergency hernia surgery during COVID-19 pandemic: a comparative study of the operative activity and outcomes before and after the outbreak

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ABSTRACT

Aim The outbreak of COVID-19 pandemic in January 2020 affected largely the elective operating for non-urgent surgical pathologies, such as hernias, due to periodical cancellations of the operating lists on a worldwide scale. To the best of our knowledge, the long-term impact of the COVID-19 pandemic in relation to the emergency hernia surgery operative workload and postoperative outcomes remains largely unknown.

Methods Retrospective research of admission, operation and inpatient records of all patients who underwent emergency surgery over a 2-year period (2019-2020) was done.

Results An 18% increase in terms of emergency hernia surgery operating volume, with a 23% increase of visceral resections due to unsalvageable herniated content strangulation was found. Overall morbidity did not increase during the pandemic period and there was no postoperative mortality or occurrence of COVID-19 related complications.

Conclusion Emergency operative management of acutely symptomatic hernias can be safely performed even during the COVID-19 infection peak waves; hernia taxis should be reserved only for patients unfit or unwilling to undergo upfront surgery.

Key words: abdominal hernia, coronavirus, SARS, general surgery

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INTRODUCTION

The outbreak of COVID-19 pandemic without a doubt affected the provision of emergency and elective surgery on a global scale. In contrast though to elective procedures, emergency surgery can hardly be postponed due to the associated increased morbidity and mortality risks; hence the public was globally encouraged to seek medical attention upon the development of acute symptoms (1,2). However, in our anecdotal institutional experience, and being in accordance to recently published data, there was a reduction in the volume of the emergency hospital admissions, with a notable increase of the complexity of the presenting problems due to delayed presentation of the patients to the acute hospital services (3). In addition, for intermittent time periods during the COVID-19 peak waves, we were obliged as surgical department to proceed with occasional cancellations of elective operations (excluding surgical oncology procedures), in order to maximise availability of critical care beds, theatre staff and medical doctors to areas of the hospital where the pressure of COVID-19 admissions was becoming overwhelming. As a result, and focusing in particular on hernia surgery, the delays in performing elective hernia repairs in a timely manner, in combination with the general trend of the public to avoid a hospital admission, led to an increase of the emergency hernia workload and presentation of patients with neglected acutely symptomatic hernias (4,5).

Under this notion, we attempted to assess the aspects regarding emergency hernia surgery in our institution since the outbreak of the COVID-19 pandemic (January–December 2020) and compare the relevant data and outcomes from the previous year (January-December 2019). The aim of this study was to capture differences between the observation periods in terms of actual operative volume changes, features of clinical presentation, postoperative outcomes and hospital-acquired COVID-19 infection rates among the patients who underwent emergency hernia surgery in our institution. To the best of our knowledge, no previous study has specifically evaluated to date the impact of COVID-19 pandemic on the emergency hernia surgery outcomes.

PATIENTS AND METHODS

Patients and study design

The Department of General Surgery, George Eliot Hospital NHS Trust (district general) has been providing continuously uninterrupted emergency general surgery services in the region of Warwickshire, UK, during the COVID-19 pandemic outbreaks. Of note, our hospital's wider capture area (West Midlands), has been in the epicentre of the pandemic in the UK with continuous strict lockdown/isolation measures during the pandemic waves. We performed a retrospective research of emergency surgical admissions between 01 January-31 December 2020 and 01 January - 31 December 2019, comparing during those two periods regarding the overall emergency hernia operative workload (number and type of operations), the visceral resection rates due to strangulation of herniated contents, as well as the postoperative 30-day morbidity and mortality rates, overall length of stay and the occurrence of hospital/community-acquired COVID-19 infection in the 2020 emergency hernia admissions. We also identified from their electronic clinical history records the elapsed time interval between the onset of the hernia-related acute symptoms and the time the patients presented to our emergency surgical service.

Methods

The relevant information was extracted from the electronic records of the daily emergency admissions, which were maintained by each one of the admitting general surgery firms, as well as from the electronic patient records and operation notes / emergency theatre records. The occurred postoperative complications were classified according to the modified Clavien-Dindo classification (6), with the complication capture period extending up to 30 days post the emergency hernia procedures.

With respect to our institutional policy regarding screening for COVID-19 infection status, all emergency surgical admissions were required to have a swab taken from the oropharynx and nostrils for polymerase chain reaction (RT-PCR) essay; upon clinical suspicion of concurrent respiratory tract symptoms, the patients would be assessed with a computed tomography (CT) scan of the chest or plain chest radiograph as per discretion of the admitting surgical team. Regarding the preopera-

tive investigations of our patients who underwent emergency hernia surgery during both study periods, all had undergone baseline blood tests including full blood count, baseline biochemical assessment of liver and renal function and clotting screening. Pre-operative CT of the abdomen and pelvis was performed at the discretion of the admitting surgical firm. Concerning the attempt for taxis of the incarcerated hernia under analgesia or sedation, in our institutional practice we avoid to proceed with this manoeuvre if the hernia is not easily reducible due to the inability to clinically exclude the presence of evolving strangulation of the herniated viscera.

Our study did not require approval from our local Ethics Committee, due to its retrospective and non-invasive nature. Input from medical statistician was not required due to the performance of essentially descriptive analysis and presentation of our data and clinical outcomes.

RESULTS

A total of 71 patients had undergone emergency hernia surgery during the entire 2-year observation period, with 39 patients being operated in 2020 and 32 in 2019, indicating an increase of 18% in terms of workload after the COVID-19 outbreak. The patient groups matched in terms of mean age and American Society of Anaesthesiologists (ASA) status full name of the abbreviation (7), but there was a noted delay of the admitted patients in terms of seeking medical attention since the onset of the acute hernia-related symptomatology (Table 1). With respect to the patients' COVID-19 infection status in the 2020 cohort, 37 (out of 39) patients had a negative PCR test on admission, while two patients were not screened (these two had preoperative imaging of the chest, one had plain radiograph and the other CT thorax, which did not show any inflammatory lung changes). Also, none of the performed preoperative chest radiographs or chest CT scans for the entire 2020 cohort detected any changes in consistency with possible COVID-19 infection. Moreover, no patient acquired the virus during their in-hospital stay, resulting in a 0% overall COVID-19 infection rate in the entire 2020 patient group.

Table 1. Patients demographic features on admission

Variable	2019	2020
Number of emergency hernia operations	32	39
Male / female	17 / 15	26 / 13
Mean age (years)	68.4	65.5
ASA grade (% from year's admissions)		
1	2 (6.3)	3 (7.7)
2	13 (40.6)	14 (35.9)
3	14 (43.8)	20 (51.3)
4	3 (9.4)	2 (5.2)
Duration of symptoms prior to admission (days)	1.31	2.03

ASA, American Society of Anaesthesiologists

Despite a small increase in the number of visceral resections in the 2020 cohort, four (12.5% in 2019 vs six (15.4%) in 2020, the 30-day postoperative morbidity rates were similar in the two study periods (36% for 2019 vs 32% for 2020, respectively), with 0% postoperative mortality during both observation periods (Table 2).

Table 2. Patients' hernia types and repair details

Operation types and hernia location	Number during the year	
	2019	2020
Open suture umbilical/paraumbilical	6	2
Open mesh umbilical/paraumbilical	4	8
Open mesh inguinal	9	13 (one recurrent)
Open suture inguinal (laparotomy)	3	1
Open mesh incisional	4	4
Open suture femoral	3	5
Open mesh (plug) femoral	-	1
Open mesh Spigelian	1	3
Open mesh other ventral	2	1
Laparoscopic mesh incisional	-	1
Visceral resections	4 (12.5%) (4 small bowel resections)	6 (15.4%) (2 right hemicolectomies /4 small bowel resections)

It has to be noted that from the 2020 study group only one patient was admitted to intensive care unit (ICU) postoperatively, having undergone abdominal wall reconstruction in the form of component separation including visceral resection (strangulated hernia, complex incisional hernia with loss of domain, performance of right hemicolectomy due to strangulation). In addition, none of the patients who were operated in 2020 had an unplanned return to ICU for respiratory tract complications or need ward-based non-invasive ventilation. Regarding need for re-operations, two patients from the 2019 period had to undergo an additional procedure under general anaesthetic (hematoma evacuation post open mesh inguinal hernia repair, orchidectomy due to severe ischemic orchitis post open mesh inguinal hernia repair), while none of the 2020 patients had an unplanned return to the operating theatre within the 30-day follow-up period (Table 3).

Table 3. Postoperative outcomes, including 30-day morbidity/mortality, length of in-hospital stay and admission to Intensive Care Unit

Variable	Postoperative outcome (No)	
	2019	2020
Clavien-Dindo classification		
II	10 RTI-abx (1) urinary retention-catheter (3) seroma-cons. Mx (2) wound infection-abx (3) CD colitis-abx (1)	7 urinary retention-catheter (2) wound infection-abx (3) seroma-cons. Mx (1) ischemic orchitis -cons. Mx (1)
IIIa	0	4 seroma - I/R drain (2) pelvic collection - I/R drain (1) wound dehiscence -VAC (1)
IIIb	2 (re-operations: hematoma evacuation / orchidectomy for ischemic orchitis)	0
IV-V	0	0
Average postoperative in-hospital stay (days)	4.7	6.8
Planned postoperative ICU admission	0	1 (CAWR patient)
Unplanned readmission to ICU	0	0

RTI, respiratory tract infection; abx, antibiotics; cons., conservative; CAWR, complex abdominal wall reconstruction; I/R, Interventional Radiology, cons. Mx, conservative management; CD colitis, Clostridium difficile colitis; VAC, vacuum-assisted closure

DISCUSSION

The outbreak of COVID-19 pandemic in 2020 has had a major impact in the delivery of elective hernia surgery, with cancellations of non-urgent elective procedures and subsequent build-up of longer waiting lists (8). Combining the latter with the tendency of the public to avoid hospital admissions unless grossly symptomatic due to the fear of acquiring COVID-19 infection, previous reports demonstrated a reduction of emergency hernia surgical activity during the first wave of the pandemic in 2020 (9). However, to the best of our knowledge, no published study has evaluated in the long run the emergency hernia surgery outcomes since the declaration of the pandemic by the World Health Organisation in January 2020. Our anecdotal experience, in accordance to previously published multi-centre studies (10), regarding the characteristics of the acute surgical admissions in general has clearly shown a significant increase in 2020 of the number of patients who come with features of neglected peritonitis secondary to perforated viscus, locally advanced obstructing tumours, as well as complicated biliary pathologies, such as gallbladder empyemas, etc. To an extent the same accounted for the acute presentations of symptomatic hernias, with an observed higher overall number of emergency hernia operations carried out during the last year. It has to be noted that our emergency surgery services have been continuously fully functioning since the outbreak of COVID-19 pandemic, in contrast to our elective hernia operating lists, which had been postponed on a rolling basis for a cumulative period of three months since January 2020.

As suspected, in 2020 we noted an 18% increase of total emergency hernia operative volume compared to 2019, with a moderate increase in the number of visceral resections due to strangulated hernia contents. The latter could be attributed to the noted delayed presentation of the patients with acutely symptomatic hernias to our emergency surgical service. Having a 0% hospital-acquired COVID-19 rate in our 2020 study group, with also absence of major postoperative respiratory complications, we demonstrated that emergency hernia surgery could be safely performed during the pandemic waves.

Therefore, we strongly advocate upfront surgery of patients with acutely symptomatic hernias, reserving taxis under analgesia/sedation only for patients who are unfit or unwilling to undergo surgery. We also strongly believe that the involved surgical societies and medical regulating authorities should send a clear message to the patients who have acutely symptomatic hernias or are currently on surgical waiting lists, advising them to seek medical advice upon any relevant concerns without delay, even during the pandemic peak waves.

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TRANSPARENCY DECLARATION

Conflict of Interest: None to declare.

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