

PROFESSIONAL PAPER

EMERGENCY SURGERY IN A REGIONAL HOSPITAL BEFORE AND DURING THE COVID 19 PANDEMIC

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ABSTRACT

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Background

In extraordinary situations the volume of work of all hospital services changes. The impact of the global COVID 19 pandemic, is classified as an international emergency situation. But, we do not know How did one regional hospital in Bosnia and Herzegovina cope with the COVID-19 pandemic in line with its capacities in terms of emergency surgery.

Materials and Methods

We used data from our surgical protocols - emergency surgery performed in our department during July and August in 2019 and 2020. We used descriptive statistics.

Results: The total number of examinations in the emergency surgical clinic was almost the same. The number of admissions in the period in question in 2020 was 36% lower in relation to the control period. The total number of operations was 17% lower. The number of emergency operations was 39.3% lower.

Conclusion: it may be said that emergency surgery functioned on a satisfactory level in our regional hospital, and that the results do not deviate significantly from data from the literature, except regarding emergency amputations and emergency surgery for malignant colorectal stenosis.

Keywords: Covid 19, emergency, surgery

INTRODUCTION

In extraordinary situations the volume of work of all hospital services changes. The impact of the global COVID 19 pandemic, proclaimed by the WHO on 11th March 2020, is classified as an international emergency situation. The Covid-19 pandemic affected many economic activities, all aspects of life, everywhere and all social and business activities^{1,2}.

In terms of surgery, the previous activities of many surgical associations aimed at developing the concept

of “patient safety” were given new importance. New safety protocols were created, with the relevant algorithms for protection of both patients and physicians,

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and staff, for the appropriate surgical and non-surgical procedures^{1,2}. On the basis of experiences from Asia and Europe, the emphasis was placed on personal protective equipment, both during transport and hospitalization^{1,2}.

All surgical procedures undermine immunity. The current virus draws iron from haemoglobin and releases it into free circulation, whereby the level of toxic activity is increased¹. Immunity is a priority for both surgery and invasive procedures. Testing sometimes gives false negative results, so re-testing is practised after 3 days, sometimes after 7 days (the rules changed), and certainly before surgery. There is no alternative to a good surgical decision. The operation must be performed urgently if delay would lead to a longer time in hospital, subsequent re-admission or in any way cause harm to the patient^{5,6,7}. Often a

consiliary decision is needed. Risk assessment must be undertaken on the basis of the clinical condition, and if the patient is Covid 19 positive or there is a strong suspicion that they are, non-surgical treatment should be considered^{3,4}. Cooperation with the anaesthesia team is vital, and during intubation there should be an anaesthesiologist with two anaesthetists in the operating theatre, and then the surgical team should enter, with no superfluous staff in the room. Work over night should be avoided, when the surgical team is limited⁴. There is no evidence that laparoscopic surgery increases the risk (due to the exsufflation of CO₂ from the patient's abdomen) but the duration of the surgery should be kept short. Therefore, the surgery must be performed in good time for the patient to have a good chance for recovery, whilst still preserving the person's health²⁻⁴.

Table 1. The number of examinations, admissions and surgical procedures

Period	Total number of surgical examinations	Total number of admissions	Number of surgical procedures	Number of emergency procedures
1.7.2019.-31.8.2019.	1181	814	282	120
1.7.2020.-31.8.2020.	1168	527	234	73

Table 2. Distribution by diagnoses

	2019	2020
Appendicitis	36(30%)	19(26.02%)
Cholecystitis	23(19.1%)	11(15.06%)
Ileus (adhesions)	13(10.8%)	9(12.32%)
Incarcerated hernia	8(6.66%)	7(9.58%)
Amputations	7(5.83%)	8(10.95%)
Polytrauma	8(6.66%)	5(6.84%)
Perforation of hollow viscus	5(4.16%)	3(4.11%)
Wound dehiscence	4(3.33%)	2(2.74%)
Abscess	7(5.85%)	4(5.48%)
Malignant colorectal stenosis	9(7.5%)	5(6.85%)
TOTAL	120(100%)	73(100%)

In the case of the current pandemic, in our surgical department the criteria for admission have been tightened, there are fewer diagnostic procedures, work is in shifts - teams are changed every fourth day, and patients visit their doctors more cautiously and somewhat later.

The question for patients and doctors is: What is truly necessary?

The Aim of the Study

To compare the number and type of emergency operations performed during two summer months (July and August) before and during the Covid 19 pandemic. Did patients report for surgery later? How did one regional hospital in Bosnia and Herzegovina cope with the COVID-19 pandemic in line with its capacities in terms of emergency surgery.

Materials and Methods

We used data from our surgical protocols - emergency surgery performed in our department during July and August in 2019 and 2020. We used descriptive statistics.

Results

The total number of examinations in the emergency surgical clinic was almost the same (Table 1). The number of admissions in the period in question in 2020 was 36% lower in relation to the control period. The total number of operations was 17% lower. The number of emergency operations was 39.3% lower (Table 2).

The greatest differences were in the number of appendectomies - 36:19 (mostly phlegmonous), and cholecystectomies 23:11 (in 2020 more than half

were gangrenous gall bladders) (Table 3). In the earlier, control, period, in 2019, there were a few more surgeries for malignant colorectal stenosis in the colon and rectum, wound dehiscence, and incision of abscesses (in 2020, 3 out of 4 abscesses were enormous).

The percentage of surgeries for perforation of the hollow viscus was almost the same (4.16%:4.11%).

The percentage of surgeries for incarcerated hernia (more often intestinal resection due to gangrene) and particularly amputation (above the knee) was higher in the period in question in 2020.

2019>2020 – appendectomy, cholecystectomy, malignant colorectal stenosis, wound dehiscence, abscesses

2019=2020 – perforation of the hollow viscus

2019<2020 – incarcerated hernia, limb amputations

Appendectomies performed – Intraoperative findings

Gangrenous, phlegmonous, normal

In the case of appendectomy, it may be noticed that the greatest difference was in the category of phlegmonous appendicitis (19/21) while there were slightly more gangrenous cases in 2019. The larger number of phlegmonous appendicitis also indicates the custom of some surgeons to declare a normal appendix to be inflamed (known to pathologists).

Emergency cholecystectomies revealed a higher number of gangrenous gall bladders (in 2020 63.6%, whilst in 2019 the figure was 43.4%), which indicates that surgery was performed later.

Table 3. Cholecystectomies performed

2019	Total performed: 23(19.1%)	Gangrene: 10(43.4%)
2020	Total performed: 11(15.06%)	Gangrene: 7(63.6%)

Table 4. The number of emergency laparoscopic procedures

	2019	2020
Appendectomy lap.	15(12.5%)	9(12.32%)
Cholecystectomy lap.	17(14.16%)	7(9.58%)

The number of laparoscopic procedures was proportionately lower in the same period in 2020, but without any great significance (Table 4).

Complications in emergency procedures:

2019 – 11/120(9.16%)

2020 – 7/73(9.58%)

Discussion

The literature is quite scant in relation to emergency surgery during the Covid 19 pandemic. The period is too short for any more comprehensive, wider conclusions^{2,4}.

Emergency cases became more challenging due to difficult and postponed diagnostics^{1,10}. Some hospitals of a similar size in the region were converted to Covid 19 hospitals, and there was no work done in operating theatres². Shift work made a so-called “second opinion” possible relating to a patient admitted the previous night, who was taken over by the next team that had to decide about an emergency procedure.

Most available research dates from the months of April, May and June of this year. The data indicate the smaller volume of emergency surgical procedures both in absolute numbers and percentages, when compared with two periods before and during the pandemic^{1,2}. The number of cholecystectomies fell (from about 15% to 5%), and appendectomies (from 32% to 25%)^{10,11} as was also shown by this research, although the differences are smaller: the number of cholecystectomies fell from 19.1% to 15.06%, while the number of appendectomies fell from 30% to 26.2%. More than half the emergency surgery departments recorded a fall in the overall

number of emergency conditions^{4,13}, which was also the case in our research.

Most authors noticed postponement, that is, patients presenting later with emergency surgical issues. In some studies, as many as 40% of non-traumatic emergency abdominal conditions had “postponed” treatment^{9,11,13}. This was also noted in our research. The explanation is found in the patients’ own choice to stay at home until their symptoms became worse, avoiding being infected, so that there was a higher number of complicated cases of appendicitis and cholecystitis, above the knee amputations due to wet gangrene, and incarcerated hernias with gangrenous intestines. Examples of fever which was not the result of Covid 19 infection but of an intra-abdominal process were also frequent. Changes in life habits, a diet with lower fat, reduced the number of acute cholecystitis¹⁰. In some centres there was a preference for non-surgical treatment using antibiotics for non-complicated appendicitis⁶⁻⁸, which we did not practice. The equal number of surgeries for perforated hollow viscus indicates that some patients in the time of the pandemic were treated using the so-called Taylor method, that is, conservatively. All of this may explain why the percentage of conditions for which there is no alternative approach increased during the pandemic, such as incarcerated hernia (an increase from 5.5% to 14%), and malignant colorectal stenosis (increasing from 8.7% to 14%)^{10,11}. In our research the number of surgeries for incarcerated hernia was also higher (6.66%:9.58%) while the percentage of malignant colorectal stenosis was slightly lower (reduced from 7.5% to 6.85%) which is not in line with the data from the literature. We also noticed a rise in the number of amputations - a jump from 5.83% to 10.95%. We explain this by

the more difficult diagnostics and the reduced work of vascular surgeons (in line with the reduction in surgical treatment of perianal abscesses - according to the recommendations of the leading surgical associations, we resolved minor cases on an out-patient basis, without bringing the patient into the operating theatre⁴. We did not stop performing laparoscopic cholecystectomies and appendectomies, according to the SAGES and EAES recommendations. In the literature, the laparoscopic approach was used in up to 69.6% of cases. The dispersion of aerosol particles was noticed in the operating theatre in only 32.3% of cases, according to the majority of studies^{3,4}. It is believed that the work of surgeons in emergency situations overall was reduced to about 1/3 in comparison with the period before the pandemic (a reduction of about 60%).⁹⁻¹¹ In our research, that ratio was not so drastic. We had about 73 emergency operations in comparison with 120 in the control period, so the reduction was about 39.17%. It could be said that the work of our emergency surgery department was reduced by 1/3, so much less than in the literature.

More difficult diagnostics and restriction of the elective programme led to more complicated cases.

In the sense of organization, nasal swabs are taken in almost all centres from only symptomatic patients and surgeons, only 1 of 10 to 1 of 6 centres take nasal swabs from all patients and surgeons before entering the operating theatre²⁻⁴. In our centre we were not able to do this, a swab was taken from every patient immediately before admission to the ward. In general, in our country testing has been less frequent than in the region. According to data from the literature, more than 70% of surgeons have performed emergency surgery during Covid 19¹⁰. In this country, 75% of surgeons have performed emergency surgery during the pandemic. The number of complications was no higher than usual. From centre to centre it ranged from 7% to 8% (septic and respiratory)^{6,7,11}. In our material there were about 9.58% complications.

Conclusion: The results relating to the number of operations are expected regardless of the fact that the availability of resources was similar (surgical and anaesthesia teams, staff, operating theatres). This was also the result of: the lower population in the region (it is reckoned that only 20% of people working temporarily abroad came home to the Doboj region in July and August this year), triage, testing for Covid, less movement by the population due to the pandemic, and fewer diagnostic procedures (EGD, colonoscopy, CDS, NMR, CT, angiography). Patients themselves came to their doctor somewhat later with acute abdomen, pain under the right costal arch and ileocecal pain, obstructed colon and bleeding, as well as the occurrence of perianal abscesses and incarcerated hernias. Bearing in mind the scope of the pandemic, it may be said that emergency surgery functioned on a satisfactory level in our regional hospital, and that the results do not deviate significantly from data from the literature, except regarding emergency amputations and emergency surgery for malignant colorectal stenosis.

Conflicts of interest

The authors have no conflict of interest.

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