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Characterisation and assessment of a surgical assessment unit (SAU) during the COVID-19 pandemic

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Abstract

Aim: To characterise the efficacy of a surgical assessment unit (SAU) located in one of the most endemic areas in the United Kingdom during the COVID-19 pandemic.

Method: Patient referrals to SAU were evaluated between 30th March-30th April 2020 and 22nd June-22nd July, 2020, assessing the patient population, investigations, management, and COVID screening.

Results: There were 266 total encounters in SAU; the average patient time in hospital was 2 hours and 6 minutes in March-April and 2 hours and 20 minutes in June-July. Encounters longer than 4 hours increased from 8% to 15%. Screening documentation for COVID-19 symptoms improved from 44% to 54% encounters between the two periods. There was only one encounter where a patient with COVID-19 symptoms was erroneously sent to SAU.

Discussion: SAUs can redirect patients away from busy A&E's (1) and decrease admissions. To reduce risk of COVID-19 infection in SAU, all patients should be screened for symptoms and/or have a negative lab result. 43.5% of patients had documented screening in March-April, and improved to 58.1% in June-July; likely the true figures are higher but poorly documented. Improved swabbing was significant and, with asymptomatic COVID-19 cases prevalent in the community, lab testing could be critical in protecting surgical patients (2). Using SAU for rapid service provision can reduce time in hospital and contribute to COVID-19 risk mitigation.

Conclusion: SAUs can provide timely delivery of surgery services and effective screening with increased lab testing can help maintain the SAU as a "COVID-19 risk-managed" area.

Recommendation: We recommend that SAUs are considered for provision of acute and emergency surgical services. Robust protocols of risk assessment and documentation should be implemented to reduce COVID-19 infection risk.

Introduction

General surgery services outside of prescheduled elective work are ideally provided through an established pathway enabling timely clinical assessment, investigations and management. The surgical assessment unit (SAU) was established to improve emergency bed flows and enable fast-track management and rapid decisions for surgical patients in a district general hospital. The establishment of an SAU at Croydon University Hospital coincided with the first wave of the COVID-19 pandemic in the UK; protecting this area from possible COVID-19 exposure proved to be an additional challenge. As hospitals continue to innovate and improve upon delivery of key services in the context of a global pandemic, identifying features of a successful SAU can guide practice that minimises infection risk and improves service efficiency. The aim of this project was to characterise the use of the SAU during the COVID-19 pandemic and identify ways it could be maintained as a "COVID-risk managed" area of the hospital.

Methods

Data on patients referred to the general surgery team for SAU admission was collected retrospectively from electronic patient records during the periods of 30th March to 30th April, 2020 and 22nd June to 22nd July, 2020. Data collected included:

- Patient demographic information (age and gender)
- Presenting complaints

- Source of referrals to SAU (A&E, surgeons, GP, community, medical team)
- Time at which referrals were made and accepted
- Investigations performed
- Length of time from referral to intervention, admission or discharge
- Documentation of screening patients for COVID-19

A proforma for data collection was used for each patient encounter; an encounter was defined as a single attendance to SAU. A patient who attends SAU multiple times would have multiple encounters even if related to the same issue.

Data was analysed using Microsoft Excel and diagrams generated with Microsoft Powerpoint.

Screening of patients for COVID-19 symptoms included asking the following questions:

- Have you experienced a new cough, fever, anosmia, or shortness of breath in the past 7 days?
- Have you had exposure to anyone unwell with COVID-19 symptoms?
- Are you currently isolating due to COVID-19?

Dates of COVID-19 PCR tests were recorded.

This project was registered with the Croydon University Hospital Compliance and Audit team on 9th July, 2020 as "Characterisation and assessment of the Rapid Surgical Assessment Unit (RASU) during the Covid-19 Pandemic." Registration number 2020/126.

Results

1. Characterisation of the patient population

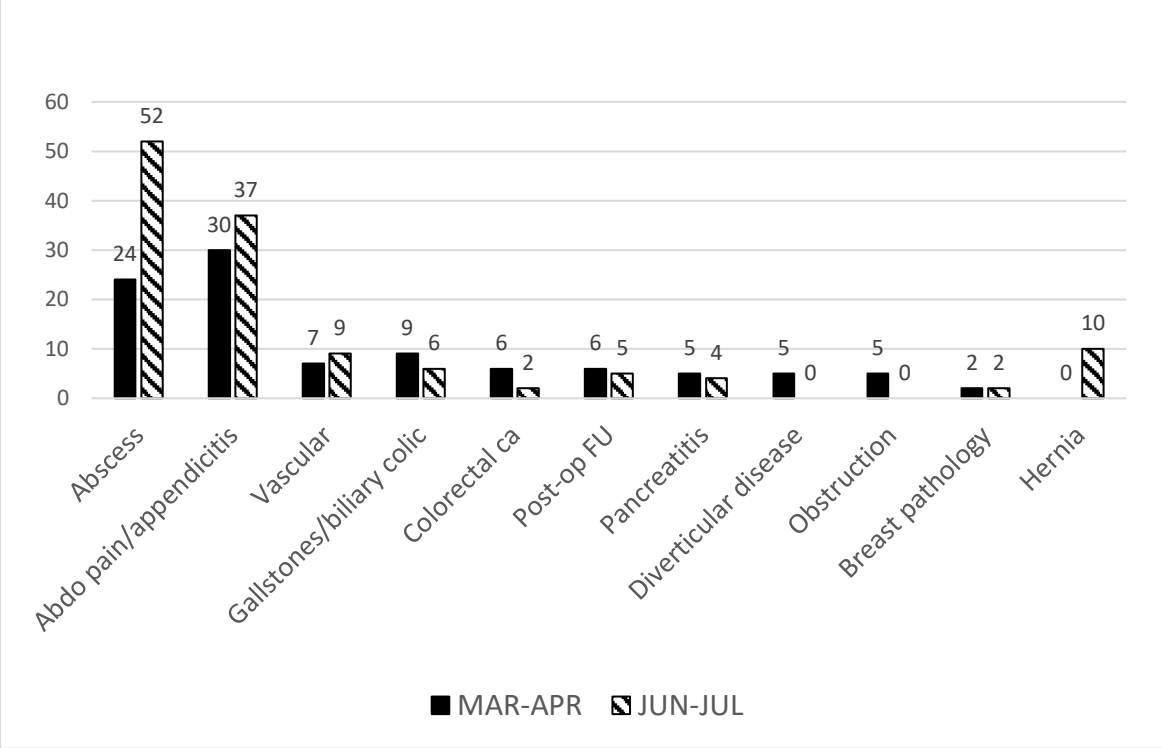
Table 1: Patient encounters and demographic information

	MAR-APR	JUN-JUL	TOTAL
Number of encounters recorded:	111	155	266
Gender			
Male	43	68	111 (42%)
Female	67	88	155 (58%)
Age			
Average age (years)	44.1	42.5	
Range	(12,90)	(7,94)	
EWS	1.26	0.78	

The number of patients in SAU increased from 111 to 155 encounters in March-April to June-July. Women comprised 58% of patient encounters and the average age was about 43 years. Early Warning Scores (EWS) were 1.26 and 0.78 on average.

2. General surgery presentations to SAU

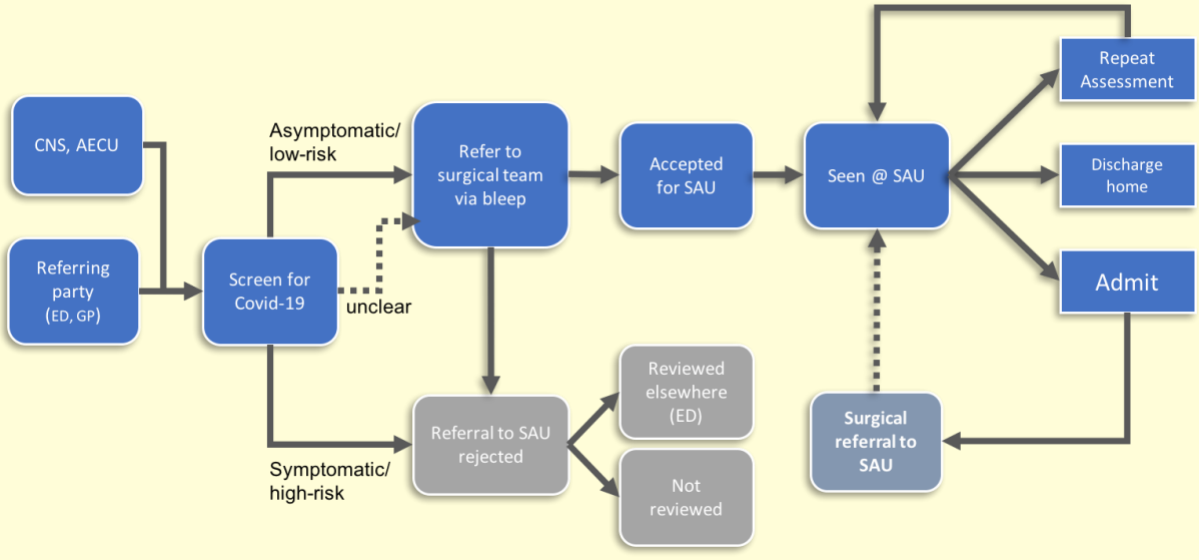
Graph 1: Top General Surgery Presentations to SAU



The most common general surgery presentations were abscesses and abdominal pain or confirmed appendicitis. The June-July period had 52 abscesses, more than double the number seen previously; acute abdominal pain and appendicitis contributed 37 encounters to this period. Other general surgery presentations (not shown) included rectal bleeding, perianal pain or injury, and inflammatory bowel disease.

3. Patient flow through SAU

Figure 1: Referrals and operational workflow via SAU



Patients are referred to SAU by clinical nurse specialists (CNS), GPs, the ambulatory medical team (AECU), and emergency department (ED, A&E) via bleep 24 hours a day. All patients should be screened for COVID-19 symptoms. If a patient is COVID-19 positive, symptomatic, has had significant exposure, or does not meet other referral criteria, SAU admission is rejected. If patients meet criteria for surgical review but not admission to SAU, the surgical team reviews elsewhere, usually in ED. If patients are considered low-risk for COVID-19 infection and meet other criteria they are accepted for SAU. Upon arrival, the patient checks in and is assessed by a surgical team member. Patients are discharged home, brought back later for further assessment or treatment, or admitted as inpatients. Some of these patients are seen in SAU after discharge for follow up.

Table 2: Parties referring to SAU

	MAR-APR	JUN-JUL
ED	43	43
Surgeons	57	97
GP/CNS	8	13
Other	3	2

ED and the surgical team referred the most to SAU, with an increased number referred in the second period. Referrals were also made from the community by GP/CNS and other parts of the hospital.

4. Time to service delivery

Table 3: Delivery of investigations and surgical services in SAU

	MAR-APR	JUN-JUL
a. First doctor to review:		
SHO	18	87
SpR	40	42
Consultant	45	2
b. Time elapsed from referral to outcome		
Avg time elapsed	2h 6 min	2h 20 min
Greater than 4 hr avg	5h 6 min	6h 31 min
# encounters >4 hours	8.1% (9)	15% (27)
c. Patients sent home and re-reviewed the following day		
# pts brought back for USS-AP	14	6
average length of encounter	1h 27min	2h 4 min
Imaging order to report (same day)	2h 36min	3h 17min

(a) During March-April, consultants were most often the first clinician to review, followed by registrars (SpR), then senior house officers (SHO). During June-July, the referral bleep was primarily held by a SHO, followed by senior

review. (b) The average time from initial referral to initiating management was 2 hours and 6 to 20 minutes. For encounters longer than 4 hours, both duration and percentage of patients increased in June-July. (c) Some stable patients requiring ultrasound-abdomen pelvis (USS AP) were sent home overnight with scheduled investigations the following day. The average length of these encounters was over an hour shorter than when imaging was requested and done on the same day.

5. Screening of patients for COVID-19

Table 4: Screening for COVID-19 before SAU admission

	MAR-APR	JUN-JUL
a. Patients asked screening questions prior to review?		
Yes	43.5%	58.1%
No/unknown	56.5%	41.9%
b. Patients swabbed prior to review?		
Yes	14.1%	46.9%
No	85.6%	53.1%
c. Number of symptomatic patients sent to SAU:		
	1	0

(a) During the March-April period, only 43.5% of patients had documentation regarding COVID-19 symptoms. This improved to 58.1% in June-July. (b) Increased swabbing was evident with an increase of 14.1% to 46.9% of patients referred to SAU having had a swab either on the day of the encounter or before SAU admission. (c) One symptomatic patient was sent to SAU during March-April, non in June-July.

Discussion

This study characterised general surgery acute and emergency services provision in a SAU established during the first wave of the COVID-19 pandemic in one of the most endemic areas of the UK. Data was collected during the initial wave (March-April 2020) and during a period with lower COVID-19 case numbers recorded (June-July 2020). This provided a unique opportunity to examine the efficacy of an SAU and how to mitigate COVID-19 infection risk.

Surgical assessment units can relieve pressure on emergency departments by redirecting referrals away from A&E's (1, 3) and avoiding unnecessary admissions (4). We show that a significant proportion of SAU encounters are from parties outside of A&E (Table 2). This cohort of patients otherwise might have attended A&E but were instead managed in SAU. We note that during June-July there was a marked increase in the total number of patients seen (Table 1). This may be attributable to fear of COVID-19 exposure and a delayed hospital attendance in the first wave that has been noted elsewhere (5-7).

The COVID-19 pandemic necessitated the rapid implementation of infection risk-reduction protocols across the NHS. In keeping with this, SAU was maintained as a COVID risk-managed area by screening patients for clinical symptoms and checking for negative lab results. Screening of patients improved over time and likely was under-documented. Documentation improved over time as SAU nurses increasingly noted screening. Improved swabbing of patients (Table 4b) admitted to SAU was significant and, in light of asymptomatic cases presenting to hospital (2), screening in conjunction with lab testing could play a significant role in decreasing infection risk for patients. One patient was erroneously sent to SAU despite displaying COVID-19 symptoms (Table 3c). Proper documentation of COVID-19 status, understanding of referral criteria and effective communication between referring and receiving parties remains critical to avoid such errors.

Nosocomial transmission remains a concern (8), and decreasing time in hospital could enhance COVID-19 infection risk mitigation. An increase in the number, percentage, and duration of encounters lasting longer than four hours was seen in June-July (Table 3b). Looking at these instances individually, many were attributable to delays outside of SAU; possibly changes in other departments due to the pandemic could account for this. The increased number of patients seen in SAU along an initial review by a junior team member could account for extra time needed to work through a higher caseload and seek senior expertise (Table 3a, 3b). Front-end specialist review could reduce time for a patient in hospital (9), particularly in more complex cases. Patients sent home experienced reduced time in hospital compared to those that stayed in hospital awaiting further investigation (Table 3c). Using the SAU as a point of rapid access could reduce time and exposure to the hospital environment.

Conclusion

SAU can provide timely delivery of general surgery services during a pandemic with reduced risk of COVID-19 exposure. Effective screening for symptoms and increased lab testing can help to maintain the SAU as a “COVID-19 risk-managed” area.

Recommendation

Hospitals and other healthcare organisations should consider establishing SAUs to streamline care and provide acute and emergency surgical services. A robust system of risk assessment and documentation of a patient’s COVID-19 status is critical to the provision of surgical care during this pandemic.

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