



Short Communication

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Emergency Surgical Unit with Point of Care Ultrasound Unit- This is the Way Forward

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Introduction

Emergency services in NHS are under an ever-increasing pressure to provide efficient, rapid and cost effective service to its patients. Due to the delay in initial investigations the diagnosis and subsequent managements is often delayed leading to increased length of hospital stay, complications and has clinical, service and cost implications.

Amidst these challenges, over the last few decades, there has been a move to improve productivity, effectiveness and quality across same day emergency care. This includes an urgent assessment and potential intervention in a dedicated acute admissions unit whereby patients can be assessed, investigated and optimized before admission to a surgical ward [1,2]. Pilot studies from many such units have demonstrated that this can lead to timely decisions regarding discharge with an appropriate management plan or admission to the hospital if needed [3,4].

Literature reveals that more than 50% of patients who present to the emergency services with acute abdominal pain can be safely sent home with a management plan without the need for admission to the hospital. Interestingly only one-fourth of the patients who attend the emergency department with abdominal pain will require surgery [5].

Unnecessary or non-urgent admissions to the hospital via emergency route can create hurdles in appropriate service provisions to the genuine elective cases because of beds shortage and thereby reduces the overall effectiveness of the general surgical service [3].

The use of radiological services can effectively help in the timely diagnosis and management of acute surgical patients.4 In

the era of modern practice reliance on radiological investigations has improved the diagnostic yield. However, at times delay in the investigation can break the diagnostic chain for many hours or days thereby often leading to unnecessary admissions and possible extended length of stay (LOS), which of course has a significant impact on patients, cost burden on the NHS, and a potential effect on appropriate service provision due to non-availability of beds for elective admissions thereby leading to cancellations of elective procedures etc. Therefore, for the same reason, the Royal College of Surgeons' guidelines has suggested 7 days' access to ultrasound, with dedicated slots for emergency surgical admissions [4,6].

Clinic Setup

At the NHS TRFT, Rotherham General hospital we started an acute surgical unit working as one-stop emergency surgical service which aimed to provide an assessment of emergency surgical patients, basic investigations and radiological investigations.

Alongside our surgical assessment unit, there was a dedicated US suite which would provide US services until 16:00. Patients presenting to the unit were assessed by the consultant on call or senior registrar. The assessment Clinic runs from 08:00 to 16:30 allowing for a maximum number of patients to be seen throughout the day without fixed appointment times. The patients are referred to the assessor or the in-charge nurse via GP or A&E until 16:00 after which the on-call registrar takes over.

Objective

The objective of this study was to evaluate the efficacy of the Acute surgical unit (ASU) and the impact of dedicated Ultrasound scan facility and same day scan (US) on the on the length of hospital stay and reducing the number of hospital admissions.

Methods

Data was retrieved from the online radiological request portal (Meditech) of the patients. Two data sets were extracted from the portal - those that had USS abdomen/pelvis request in October/November and April/May representing Pre-ASU period and post-ASU respectively.

Retrospective data of 80 consecutive patients was extracted from each time frame for these patients from the electronic records.

The data that was extracted included demographics, day of USS ordered, day of USS performed, admission to hospital, Length of hospital stay (LOS) and category of diagnosis.

Those patients who did not have USS as their first line of the investigation were excluded from the study. Also, those patients

whose reason for admission was not acute abdominal pain (renal, biliary, gynaecology or non-specific) their data was not included in the study.

The retrieved data were compared between the patients who had clinical management before and after the establishment of a purpose-built ASU with its ultrasound scan with sonographers and assessed by assessors (Consultants and senior registrars). The comparison of means between the groups was focused on and statistically analysed for significance using T-test.

Results

The introduction of dedicated admission unit with ultrasound back up led to significant decrease in admission rate and hospital stay. There was no difference in readmission rates between the two groups (Figure 1) (Tables 1-3).

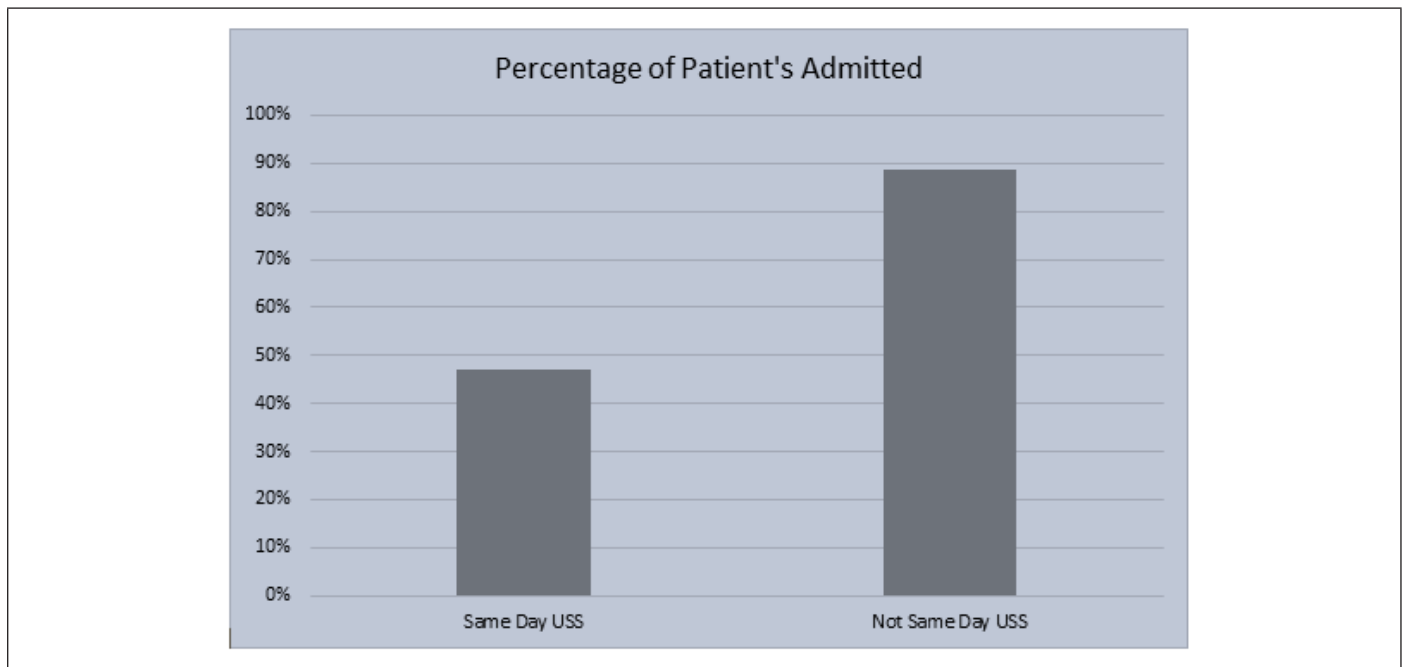


Figure 1: USS done on the same day in ASU decreased the admission rates by 41.65%.

Table 1: The average LOS for each admission was reduced by 1 day (P=0.0489 95%CI of mean reduction =-2.22, -0.01) which, is therefore statistically significant.

LOS	US Same Day (n=96)	US Not on Day of Admission (n=62)	Change
Mean	2.15	3.26	-1.11
Median	0(No overnight stay)	2	-2

Table 2: The Admission rates were 39% less in ASU (p<0.0001 CI 95% (23.59% to 50.60%).

	Pre-ASU (n=80)	ASU (n=78)	Difference
Same day DC	13	43	30
Number admitted (overnight stay)	67	36	31
Percentage admitted	83.75%	45.57%	38.81%

Since implementation of ASU the number of patients receiving same day USS has increased by 37% (p<0.0001) and therefore led to more patients being discharged the same day than Pre-ASU setup.

Table 3: Overall the LOS decreased by 1½ days when compared to pre-ASU (P =0.0180 CI 95%(0.23 to 2.38) Therefore - Statistically significant.

LOS	Pre- ASU (n=80)	ASU (n=78)	Change
Mean	3.23	1.92	1.4
Median	2	0 (no overnight stay)	2

All these results are statistically significant which can also be translated into improved patient's care and lesser admissions burden.

Discussion

The terms "clinical ultrasound" and "point-of-care ultrasound" (POCUS) are used to describe a bedside ultrasound examination performed by the treating doctor, as an adjunct to clinical evaluation [6]. The routine use of abdominal US for investigating abdominal pain is gaining popularity due to low risk and cost and easy availability. While the national health service continues its efforts to improve the effectiveness of the healthcare and achieving a cost-effective health service many trusts have started provision of acute emergency services in the form of ambulatory units. These, in turn, are reducing the number of hospital admissions and leading to management of a greater number of patients effectively as outpatients and cost-effectively. Our results have shown a positive impact on the service and it correlates to work done by other trusts [5].

Studies by Johnstone et al. [7] & Tierney et al. [8] found that a clinical ambulatory unit for emergency referrals is safe and effective.

Johnstone et al. [7] reported that when Patients were assessed and managed soon after arrival by the Registrar or consultant. The rate of same-day discharge was higher, and overall there was a reduction of on forth of admissions in emergency surgical units.

We have reasons to believe that provision of dedicated US service to the acute surgical unit imparts statistically significant improvement in the overall service and cost-effectiveness. Many people including patients, GPs and the surgical team have reported a very high level of satisfaction with prompt management plans and investigations [9].

Also in the given era of high levels of patients' awareness, complaints and legalities of practice there is an increasing trend of defensive practice these facilities can be effectively utilized to identify the cohort of patients who truly will fall in the group of genuine immediate admissions or those who can be managed at home as outpatients or a slightly less acute setting [9].

Conclusion

The admission to ASU was reduced significantly from 85.37 % to 45.57 % (38.81%) and mean length of stay also reduced from 3.23 to 1.92 (1.4) days. ASU with purpose-built same day ultrasound department with assessors is the way forward in NHS in reducing the costs and dealing patients clinical issues effectively and quickly.

However, our study has its limitations too. There could be a selection bias to the streaming process of ASU, some of these patients may have been assessed in A&E and sent straight home previously. Also, we only assessed data within weekdays, as these are the days that ASU-US is available in our trust. We welcome and recommend potential future research to compare to admission rates of the acute abdomen at the weekend and compare rates of admission and LOS for the feasibility for a 7d a week USS in ASU as per Royal College of Surgeons' guidance.

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