

Surgical Emergencies and Manpower

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Summary

The emergency surgical admissions to one firm during the year 1979 have been reviewed. Emergency cases constituted half the workload of this and other units in the hospital. Male and female admissions were equal. The under twenty year old was the largest age group admitted. The commonest diagnosis, non specific abdominal pain, was made in 22.9% of all the patients and acute appendicitis accounted for 11.1%, whilst the remainder fell into a large number of diagnostic categories with only a few patients in each. Only 30.2% of all the patients had an operation within 48 h of admission. These figures suggest that surgical trainees may no longer gain the experience in managing acute admissions which was once possible and that any future training programmes must ensure wider exposure to surgical emergencies.

Introduction

Surgical manpower has attracted much discussion recently with one report suggesting that the registrar grade should be reduced whilst increasing the number of consultants (1). This would inevitably lead to a change in the grade of surgeon managing acute emergencies, with consultants undertaking a larger proportion of this work. Though the management of acute surgical problems is considered a vital part of a surgeon's training, quantitative data as to the exact nature of this workload does not exist. It is probable that the character of such admissions has changed considerably over the last two decades. This study was designed to review current emergency surgical admissions, their precise diagnosis and management.

Methods

All cases admitted as an emergency during one year to one surgical firm were studied retrospectively, information from the patients' notes being recorded in a form suitable for subsequent computer analysis using SPSS sub-programmes on an ICL 1906A computer (2). Cases were identified using discharge summaries, hospital activity analysis records and operating theatre records. All patients who were not admitted from the waiting list have been included, together with those admitted directly from outpatients and repeat admissions. Internal referrals to the firm were excluded unless an emergency operation was performed. The final diagnosis after suitable investigations or operations was used

as this was occasionally different from the diagnosis on discharge.

THE FIRM AND THE HOSPITAL

The firm studied consists of 2 consultants, 1 senior registrar, 1 registrar and 1 SHO and its main interest is gastroenterology.

The hospital serves a population of 800 000 and is the site of the only Accident and Emergency Department in Nottingham. A surgical firm is always available to admit trauma and seriously ill patients, but patients considered fit enough are transferred to another hospital should it be their 'on take' day.

During the first 5 months of the year, the firm was 'on take' once every 8 days; this was increased to once every 4 days during the latter part of the year. It is hospital policy that all cases of upper gastro-intestinal bleeding are admitted under the care of a physician, head injuries under the care of an accident and emergency consultant and soft tissue injuries to an orthopaedic surgeon. Urological cases were admitted under the care of the firm being studied but some were transferred to a urological surgeon the following day. All children under the age of 12 are admitted under the care of a paediatric surgeon, whilst children between 12 and 14 are admitted under either a general or paediatric surgeon.

Patients already under the care of a particular consultant are always re-admitted directly to his care.

Results

PATIENTS

There were 524 emergency admissions out of a total of 1068 admissions, constituting 49.1% of the total workload, a percentage similar to that seen on other firms in the hospital.

Of the admissions 273 (52.1%) were male and 251 (47.9%) female, their mean age was 46.9 (± 1.03 sem) years, median 47 (range 12-99) years. Two peaks were seen, one in the under 20 year old group, the other in the seventh and eighth decades, admissions falling to their lowest level for patients between 40 and 50.

ADMISSIONS

The number of patients admitted on each weekday was constant but this number fell at weekends (Table I). The busiest period for admissions was between 1.00 pm and 8.00 pm when 58.8% were admitted. 107 (20.4%) of the patients admitted were already under the care of the firm.

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TABLE I Daily variations of patients admitted on full emergency take

Day	Number of patients (\pm SEM)
Monday	11.08 (\pm 0.96)
Tuesday	11.60 (\pm 0.51)
Wednesday	9.80 (\pm 0.66)
Thursday	10.50 (\pm 0.90)
Friday	11.60 (\pm 0.67)
Saturday	7.00 (\pm 1.46)
Sunday	7.40 (\pm 1.16)

DIAGNOSIS

The principal diagnosis shown in Table II was the actual reason for admission, thus a patient admitted for the treatment of bone pain due to carcinomatosis of the breast would have the principal diagnosis entered as widespread malignant disease.

TABLE II Principle diagnosis

Diagnosis	Number of cases	%
Non specific abdominal pain	120	22.9
Acute appendicitis	58	11.1
Peptic ulceration and its complications	22	4.2
Painful biliary tract disease	16	3.0
Small bowel obstruction	18	3.4
Large bowel obstruction	8	1.5
Diverticular disease	8	1.5
Large bowel bleeding	8	1.5
Other anorectal conditions	5	1.0
External hernias	15	2.9
Acute pancreatitis	11	2.1
Arterial disease	13	2.5
Venous disease	5	1.0
Primary carcinoma	16	3.0
Widespread malignant disease	43	8.3
Retention of urine	21	4.0
Ureteric colic	16	3.0
Urinary tract infections	11	2.1
Torsion of testicle	5	1.0
Other urological diseases	15	2.9
Abscess	31	5.9
Trauma	28	5.3
Gynaecological diseases	9	1.7
Orthopaedic diseases	3	0.6
Medical diseases	7	1.4
Other diagnoses	12	2.3
Total	524	100

Non specific abdominal pain (NSAP), the most frequent diagnosis accounted for 120 (22.9%) of the admissions and was made when no cause for the abdominal pain could be found after observation, investigation or operation.

Acute appendicitis, proven histologically, was seen in 58 (11%) of all admissions, and was the commonest single diagnosis needing operative intervention. Ten 'normal' appendicectomies were performed.

There were 14 (2.7%) patients with perforated peptic ulcer: 10 were duodenal ulcers, 3 gastric ulcers and 1 stomal ulcer. There were only 2 bleeding duodenal ulcers and 1 bleeding gastric ulcer.

Of the 18 (3.4%) cases of small bowel obstruction, 3 were due to adhesions, 3 to intussusceptions, 3 secondary to peritoneal carcinomatosis, 2 to internal hernias, and 1 due to radiation stricture. Six responded to conservative treatment and thus the underlying cause was not ascertained.

Large bowel obstruction was seen on 8 (1.5%) occasions, 4 of which were due to previously undiagnosed tumours; 1 was due to diverticular stricture, 2 were due to a volvulus of the

caecum and there was one case of pseudo-obstruction of the large bowel. Three cases of perforated diverticular disease were treated and there were 5 cases of pain due to diverticular disease which did not require operative intervention. The 8 cases of large bowel bleeding were all due to different causes.

Of the 15 (2.9%) patients with problems associated with external hernias only 3 were obstructed or strangulated, 6 were irreducible, and all these patients required an emergency operation. The remainder had either spontaneously reduced by the time of admission or were easily reduced on the ward.

Five patients with acute problems associated with arterial aneurysms were admitted. The remainder of the patients with arterial disease consisted of 4 with superior mesenteric occlusion and 4 with peripheral vascular disease.

Sixteen (3.0%) patients were admitted in whom a final diagnosis of a primary carcinoma was made. These were cases in which a large tumour was noted in out-patients, or cases which were admitted as a case of abdominal pain which was finally diagnosed as being due to a primary malignant lesion. There were 43 admissions due to widespread malignant disease; of these, 20 were admitted for terminal care, the remainder for assessment and pain relief.

Twenty-eight (5.3%) patients were admitted as a result of trauma; of these 14 were admitted for observation only, the remainder of the patients needing an operation for a wide variety of injuries.

Nine (1.7%) patients who were finally diagnosed as having gynaecological diseases were admitted; 3 of these were ectopic pregnancies which were diagnosed and treated by a general surgeon.

OPERATIONS

Of the patients 158 (30.2%) underwent an operation during the first 48 hrs of admission and in total 223 (42.5%) of the patients had an operation. The type of operation performed reflected the wide range of diagnoses. The SHO and registrar performed the majority of operations whilst in 58% of the operations an SHO was the sole anaesthetist (Table III).

TABLE III Grade of surgeon and anaesthetist for all operations

Grade	Surgeon		Anaesthetist	
	No. of ops	%	No. of ops.	%
H. S.	3	1.3	—	—
S.H.O.	67	30.0	130	58.3
Registrar	81	36.3	30	13.4
Senior registrar	28	12.6	37	16.6
Consultant	44	19.8	14	6.3
L.A.	—	—	12	5.4
Total	223	100.0	223	100.0

Seventy-two (46.2%) of all the operations performed were started between 6.00 pm and 2.00 am. The mean time between admission and starting an operation was 8.70 (\pm 0.93 sem) h for those going to theatre within 48 h of admission.

LENGTH OF ADMISSION

The mean length of admission was 9.30 (\pm 0.45 sem) days. 58% of the patients stayed for less than 7 nights, 84.1% being discharged within 14 nights of admission and only 1.9% stayed longer than 6 weeks. There was no statistically significant correlation between age of the patient and length of admission.

DEATHS AND COMPLICATIONS

There were 45 (8.6%) deaths during the year, 28 were associated with malignant disease, in 3 of which operative

cure had been attempted but was not possible. Fourteen deaths occurred postoperatively; 2 of these had undergone a second operation. The mean time of death after admission was 10.75 (± 1.34 sem) days.

Sixty-eight (30.4%) patients developed postoperative complications, the most common being a chest infection which occurred in 22 (9.9%) patients (Table IV). Fifteen patients (6.7%) developed a wound infection or abscess and 3 developed an intra-abdominal abscess.

TABLE IV Postoperative complications: 68 patients (30.4%)

Complication	Number of times recorded
Chest infection	22
Wound infection abscess	15
Intra abdominal abscess	3
Wound dehiscence	2
Thromboembolism	8
Post operative bleeding	5
Acute renal failure	2
Urinary problems	14
Prolonged post operative ileus	5
Ischaemic heart disease	12
Others	11
Total	99

There were 6 cases of postoperative deep vein thrombosis and 2 of pulmonary embolism, one of which was fatal. This gave an incidence of thromboembolic disease of 3.6% and none of these cases received prophylaxis. There were 4 cases of postoperative urinary tract infections, all of which were associated with an indwelling catheter. No correlation could be found between the grade of surgeon and anaesthetist and the number of postoperative complications.

Discussion

The percentage of each diagnosis presenting as acute abdominal pain in this series bears a close relationship to that reported by DeDombal (3). This suggests that the population being studied in this series is similar to that elsewhere in the country. An international survey of patients presenting with acute abdominal pain also reported very similar figures (4), whilst also commenting on the falling incidence of perforated peptic ulcer, as seen in this report.

Emergency admissions formed half the workload of this surgical firm, a similar figure to that recorded by Gilmore *et al.* (5), but higher than the 21.9% recorded by Gough *et al.* (6). The lower figure is perhaps due in part to the fact that Gough and colleagues included endoscopy cases in the total workload and also were able to discharge 100 emergency referrals after examination in casualty.

No reason could be found for the lower number of patients admitted at weekends. As there was no compensatory rise in admissions on Monday it is tempting to postulate that time alone may cure some patients.

The incidence of 6.6% for wound infection is probably falsely low as this is a retrospective survey. As all the potentially infected cases and cases of bowel surgery were given metronidazole often with another antibiotic, usually an aminoglycoside, this figure may reflect the benefit of an antibiotic prophylaxis regime (7).

Nine per cent of the operative cases developed a chest infection which could not be correlated with any particular feature, such as age, length of symptoms and type of operation, though the smoking habits of the patients were

not recorded. Gough (6) reported an incidence of 10% in patients undergoing major surgery, but an incidence of 4% was recorded by Gilmore (5). No relationship between grade of surgeon or anaesthetist and the number of postoperative complications could be found as more senior staff tend to perform more difficult procedures in less fit patients.

The emergency operative rate of 30.2% compares with that of 50% and 25% in other series (6,8), though the definition of an emergency operation is not always clear. The commonest procedure, appendicectomy, was performed in 41.7% of all the operative cases, similar to the 53% reported by Doran (8).

The grade of junior surgeons performing an emergency operation in Gough's series (6) was senior registrar 32% and registrar 54% compared to 13 and 36% respectively in this report, but the former had excluded the senior house officer who performed nearly a third of the operations in this series. The consultant staff were undertaking the same number of operations in both series, between 14% and 19%. 59.4% of all operations performed within 48 h of admission could be classified as minor and hence should be within the scope of a reasonably trained SHO.

The supposed common surgical emergencies such as perforated peptic ulcer and strangulated external hernia in fact play a rather minor role in emergency surgery today. The two commonest diagnoses in this series, NSAP and acute appendicitis, themselves account for 34% of all emergencies, the remainder consisting of a very wide range of diagnostic categories with very few patients in each. Today's surgical trainee has to endeavour to identify those patients with a wide range of serious problems from a large group with non-serious self limiting conditions. As trainees no longer work the demanding rotas of the past, they will find it more difficult to collect extensive clinical expertise as many of the one time common problems are now rarely seen. Therefore in planning any new surgical training program, it will be essential to ensure that each trainee has adequate exposure to the wide range of surgical emergencies.

Should the registrar grade be reduced, the emergency workload which would be undertaken by consultants would perhaps not be as arduous as has been suggested.

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