

Introduction of a hand trauma day surgery operating list

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Abstract

Due to a huge increase in hand trauma referrals to our busy plastic surgical unit, we introduced a dedicated half-day hand trauma day surgery (HTDS) list to try and reduce the pressure on inpatient beds and length of wait for surgery. We reviewed the first 101 cases treated on the HTDS list to determine whether this allowed adequate specialist treatment of these injuries and to assess outcome and complications rates. Only one patient needed admission following surgery and our complication rate compared favourably with that of patients admitted and treated in the standard manner. We conclude that a HTDS list is both an effective and efficient method of treating a wide range of hand injuries. © 2001 Elsevier Science B.V. All rights reserved.

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1. Introduction

The Queen Victoria Hospital is a regional referral centre for plastic surgery, burns and hand trauma for the South East region of England with a catchment population close to 4 million people and serviced by 21 referring Accident and Emergency departments and Minor Injuries Units. There are nine plastic surgery consultants at the hospital, of which two are specialist hand surgeons.

An audit of the workload of trauma patients performed in 1992 and again in 1998 by our clinical audit department showed that approximately 50% of all trauma referrals were for hand injuries and this proportion had remained essentially constant over the time period. The absolute number of referrals had tripled over the 6 years. This increase in workload had major implications for hospital resources in that in-patient beds were being blocked by patients waiting for often relatively minor hand surgery at the expense of elective surgical admissions. This encroachment on our elective surgical workload prompted us to examine other options for managing hand trauma and led to the introduction of the hand trauma day surgery (HTDS) operating list. Its aim was to improve the efficiency of

our hand trauma service by reducing both unnecessary hospital admissions and patient waiting times.

We report our experience of the first 101 cases treated as out-patients at the Day Surgery Unit.

2. Patients and methods

All our referring Accident and Emergency departments and Minor Injuries Units were sent a letter explaining the rationale behind the introduction of the HTDS list and including a list of injuries suitable for inclusion on a day case list. (Table 1). Contraindications to inclusion were also listed (Table 2). All patients were told to expect surgery under a regional or local anaesthetic.

The HTDS list runs from 08:30 to 12:30 h on weekdays and can accommodate four patients with an expected total theatre time of up to 1 h for each. Suitable patients were given an appointment time over the telephone at which to attend the Day Surgery Unit the following day, 1 h before their expected surgical start time, to allow full assessment by the surgeon and placement of a regional anaesthetic block if necessary. All patients were asked to be 'nil by mouth' for 6 h prior to surgery as a precaution.

After surgery all patients who needed it were seen by the physiotherapists for initiation of their rehabilitation

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Table 1
Injuries suitable for the HTDS list

Isolated tendon injuries
Isolated digital nerve injuries
Small skin defects for grafting or local flap coverage
Finger tip injuries
Closed fractures for MUA or ORIF

regime and by the occupational therapists for fitting of a definitive orthosis before being allowed home. Where formal physiotherapy was not indicated, printed instruction sheets regarding hand exercises and rehabilitation were provided. If appropriate, an early outpatient appointment was made to ensure that correct physical rehabilitation was taking place, otherwise a 'routine' two week appointment was given. Most patients were prescribed a 5-day course of oral antibiotics, typically flucloxacillin 500 mg QDS.

We reviewed retrospectively the case notes of the first 101 patients treated on the HTDS list from its institution on 1st November, 1998 to 28th February, 1999. The data collected included age, mechanism of injury, operation performed, anaesthetic and hand therapy requirements as well as any complications.

3. Results

In the first 4 months of the HTDS list 101 patients were treated, of which 89 were male and 12 female. The average age was 37 years (range 17–70). The mechanism of injury is shown in Table 3. Thirty-eight patients were operated on under local anaesthetic, 53 under a regional anaesthetic and ten under a general anaesthetic. The complete range of operations performed is listed in Table 4. The commonest procedures undertaken were wound exploration (16/101), repair of a single extensor tendon (13/101) and repair of a digital nerve (11/101).

Forty-eight patients required both physiotherapy and occupational therapy input post-operatively, 12 required only physiotherapy and four had occupational therapy alone. A small number of patients had to be brought back the following day as their regional block was still too dense to co-operate with physiotherapy on the day of surgery. Only one patient needed admission to hospital directly after their 'day case' surgery, to

Table 2
Contraindications to the HTDS list

Under age 16
Bilateral injury
No transport to and from hospital
Poor domestic circumstances/support
Significant medical or psychiatric history

Table 3
Mechanism of injury

Mechanism of injury	No. of cases
Work	50
Domestic	47
Sport	2
Fight	1
Deliberate self harm	1

receive intravenous antibiotics for an established severe hand infection. All ten patients who had a general anaesthetic were discharged the same day. All patients received an outpatient appointment for 1 or 2 weeks post-operatively depending on the severity of their injury and the need for close supervision of their physical rehabilitation programme.

There was a single case where an axillary block failed to provide anaesthesia to the surgical field; the patient then had a general anaesthetic and his flexor tendon repaired uneventfully. He was discharged home the same day. There were 13 early surgical complications after discharge from the day surgery unit in our follow-up period of between 3 and 6 months. In our series we encountered one patient who presented to our minor injuries unit with a large wound haematoma that required drainage but did not need admission. Seven patients suffered postoperative wound infections, four of which required subsequent admission to our hospital for intravenous antibiotics and three treated with oral antibiotics at home. Three patients ruptured their ten-

Table 4
Operations performed and structures repaired

Operation	No. of cases
Wound exploration	16
Single extensor tendon repair	13
DN repair	11
Single flexor tendon repair	10
Nail bed repair	10
Multiple extensor tendons repair	6
FDS+FDP+DN repair	5
Removal foreign body	5
Digital nerve+artery repair	4
Extensor tendon+DN repair	4
FDP+DN repair	3
Local flap	3
Terminalisation of digit	3
Full thickness skin graft	3
Joint capsule repair	2
Excision pyogenic granuloma	1
Median nerve repair+local flap	1
ORIF	1
Total	101

Abbreviations: DN, digital nerve; FDS, flexor digitorum superficialis; FDP, flexor digitorum profundus; ORIF, fracture open reduction and internal fixation.

don repair. Two of these ruptures occurred 5 weeks into the rehabilitation regime and the third occurred 6 days post-operatively during a physiotherapy session. This latter case become infected and needed admission for debridement and intravenous antibiotics. All three patients who ruptured their tendon repairs are being treated with delayed two-stage reconstructions. Continued close follow-up of our patients revealed one patient who had developed tendon adhesions for which he is awaiting tenolysis and one patient was diagnosed as having an early reflex sympathetic dystrophy for which he is receiving intensive physiotherapy.

4. Discussion

In the past, referral of hand injuries of a relatively minor nature from our regional Accident and Emergency Departments has been sporadic at best. A concerted effort to educate casualty medical and nursing staff by a twice yearly trauma course, as to what should be referred early to a specialist hand centre, has been successful and has resulted in a huge increase in the amount of hand trauma being seen in our unit. Previously these referrals were dealt with by admission to the Queen Victoria Hospital, where they waited their turn on a trauma list that ostensibly ran in the order in which the cases were booked. Inevitably minor operations, such as nail bed repairs were often relegated down the list behind bigger cases such as open fractures and dirty injuries. This resulted in many patients waiting for two or three days in hospital for minor surgery and blocking a surgical bed unnecessarily. It was also a considerable inconvenience for the patients.

The Royal College of Surgeons of England [1] and the two recent CEPOD [2,3] reports have voiced concerns at the amount of out of hours operating performed on emergency and trauma patients often with little or no consultant supervision. Several studies have shown benefits in both general surgery [4] and orthopaedics [5] from the introduction of dedicated daytime, or even half day, [6] consultant supervised emergency/trauma lists. Whilst the Queen Victoria Hospital already has a dedicated all day trauma list, hand surgery, which is increasingly being practised as a separate subspecialty by plastic and orthopaedic surgeons alike, has to take its turn with everything else on the general trauma list and many minor procedures are often left to be performed out of hours.

Ideally injuries should be treated promptly whilst the tissues are relatively untainted by inflammation, oedema and infection. We can do little to influence the delay between injury and presentation at the Accident department but we should strive to minimise the delays from time of referral to surgery.

The introduction of the HTDS list has addressed all these points. It provides a dedicated daytime hand trauma list allowing consultant supervision. It has reduced the number of hand trauma patients admitted to hospital and has released beds for elective surgery patients. The benefits to the hospital are obvious although we currently have no method of quantifying any cost benefits. Our admission to hospital rate of 1% is in line with other studies of ambulatory surgery [7,8]. From a surgical point of view the delay between injury and surgery has been reduced markedly and presents the tissues in better condition for surgery which is reflected in the lower rate (4%) of serious post-operative hand infections compared to other studies [9,10].

As the HTDS list for the following day is organised over the telephone between the on-call plastic surgical senior house officer and the referring Accident and Emergency Departments, it is effectively turned into a semi-elective list allowing surgeons, staff and hand therapists to plan their day more efficiently. This arrangement allows some flexibility, such that if there is an overwhelming clinical need, the HTDS list can be abandoned and no cases booked. Theatre resources and staff can then be directed elsewhere, such as to an emergency free flap procedure, although this is an infrequent occurrence. Unfortunately our HTDS list currently runs in the mornings only and can accommodate only four patients. Any further cases referred with a hand injury suitable for day care management are either treated in the standard fashion by admission and waiting or booked onto the HTDS list 2 days hence. The latter may be more convenient for the patient by avoiding admission, but does not eliminate the surgical delays already described.

By performing all procedures under either local anaesthetic digital ring block or regional anaesthetic techniques such as axillary brachial plexus blocks we aim to avoid the major potential complications of general anaesthesia [11]. There have been some teething problems in trying to use a regional anaesthetic technique service only. Some of the anaesthetists have found that placement of blocks takes longer and gives less reliable results than giving a routine general anaesthetic. It could be argued that this provides an excellent training opportunity for the junior anaesthetist to consolidate the skills of regional upper limb blocks.

There are obvious discrepancies between the stated indications for the HTDS list and the range of operations actually performed with much more complex injuries than expected being dealt with on the HTDS list. We accept that it is very difficult to fully and accurately assess the total extent of a patient's injuries when they are in pain, under the influence of alcohol or uncooperative on presentation to an accident department. In these circumstances it is easy to understand how injuries are greatly underestimated, something that is only fully

appreciated when the patient is under anaesthetic and a full exploration can be undertaken.

5. Conclusion

On the basis of our early results we feel that the introduction of a HTDS operating list at our hospital has been a great success. It has allowed an increased throughput of hand trauma patients to be treated in a timely manner without increasing the rate of complications or impinging on our elective surgical work. Further work is in progress to assess the longer-term outcome of these patients. Based on our preliminary results we would recommend that any unit that has a significant proportion of hand injuries in its trauma workload should consider introducing a HTDS list.

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