Research and Review Insights

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Virtual fracture clinic in the management of foot and ankle fractures

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Abstract

Background: Most patients presenting to the emergency department with foot and ankle injuries can be managed as outpatients. Virtual fracture clinics (VFC) are becoming increasingly popular and help reduce the workload on outpatient clinics. Our study aimed to assess patient outcomes and satisfaction after discharge from a virtual fracture clinic without a face-to-face follow up.

Patients and methods: 200 patients with foot and ankle injuries referred to the virtual fracture clinic over a period of 4 months from October 2015 to January 2016 were reviewed. Data regarding the number of subsequent clinic appointments was collected for both patients discharged from the VFC and those that were referred for follow up. Radiographs for both these groups of patients were reviewed. A telephone survey was conducted on 33 patients to assess their satisfaction.

Results: 82 (41%) patients were discharged from the virtual fracture clinic without follow up. Of these, 4 (4.87%) patients needed to return to the clinic for further appointments. Out of the 33 patients surveyed 94% rated the service as good or excellent and 97% said they would be likely or extremely likely to recommend the service to a family member or friend.

Conclusions: The virtual fracture clinic in our institution is safe and effective with high patient satisfaction. Discharged patients have good outcomes with a very low percentage returning to clinic for further review or needing subsequent x-rays.

Background

Patients with musculoskeletal injuries are initially seen in Emergency Departments (ED) or Minor Injuries units. The majority of cases seen are discharged home with splintage, analgesia and essential information about the injury. All these patients are reviewed in fracture clinics by clinicians with varying levels of experience ranging from Junior Trainees, Career Grades and Consultants. This system goes back to the uncoordinated fracture management protocols from the early twentieth century [1]. Although the knowledge of the natural history and management of these injuries have improved, this system of fracture management is still being adopted. This unfocused system means that while on one hand minor injuries are being over investigated and unnecessarily followed up, complex injuries requiring specialist input get sub optimal care. Many injuries get unnecessarily over treated leading to prolonged immobilization and repeated imaging.

Moreover, most orthopaedic units have seen increase in number of patients referred to them with less severe injuries. The contributing factors has been reduced orthopaedic experience among the referring staff in the Accident and Emergency departments, the increase in number of extended scope nurses and physiotherapists and the loss of ED review clinics for minor musculoskeletal injuries [2].

To address this shortcoming, the Virtual Fracture clinic (VFC) was introduced in Glasgow Royal Infirmary in 2011 [3]. The aim was to standardise treatment pathways and enable better resource utilization.

We at Manchester University foundation Trust (MFT) adopted the VFC System in August 2015 [4]. A detailed guideline on the running of this new system was set out by a multidisciplinary team. This included a list of common musculoskeletal injury scenarios and how these should be managed in terms of which ones can be safely discharged, which one must be admitted for inpatient care and which ones should be reviewed in the Virtual Fracture clinic. This guideline has been continuously reviewed and modified and the present version includes a list of 56 injury scenarios out of which 30 were identified for referral to the Virtual Fracture clinic.

The virtual Fracture clinic is conducted every day by a consultant and a trauma specialist nurse. Clinical records, imaging and treatment given is reviewed. A treatment plan is made, and decision taken as to whether the patient needs to be seen face-to-face in clinic or discharged with information and advice. The trauma nurse contacts each patient to explain the outcome of the VFC review. A telephone hotline is provided so that the patient can have expert high quality advice in case of any ongoing problems. If there are problems with communication, diagnostic or treatment uncertainty, or strong patient preference a physical review is offered. Patient is brought back to a clinic for complex injuries and for injuries where multiple treatment options exist. Our protocol states that all patients shall receive a follow up phone call within 3 days of their A&E attendance. A radiologist or a reporting radiographer reviews all radiographs within 24 hours.

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In this study we aim to assess the efficiency of this system with respect to foot and ankle injuries as well assessing patient satisfaction.

Patients and methods

We retrospectively looked at data on 200 patients with foot and ankle injuries referred to the virtual fracture clinic from October 2015 to January 2016. Patient demographics, injury and treatment details were obtained from the trust's trauma database Trauma Information Gateway and Emergency Rehabilitation (TIGER). Radiographs and their formal reports were collected from the Picture Archiving and Communication system in the trust (PACS). We looked at patients who had to return to clinic after being discharged from the VFC. The theory being that a successful and safe management protocol will have good patient outcomes with very low numbers of discharged patients returning to the clinic for subsequent x-rays or treatment of complications. Patient satisfaction was assessed based on a questionnaire by telephone interviews (Table 1). This also picked up unplanned re-attendance to either A&E or the fracture clinic.

The following information was collated for each patient:

- Sex
- Age
- Date of VFC
- Mechanism of Injury
- Diagnosis
- Treatment
- Discharged following VFC (Y/N)
- No. of subsequent clinic episodes
- No of total x-rays

A subset of 80 patients from the original 200 that had been discharged from the virtual fracture clinic, were contacted via telephone. Of the 80 patients telephoned, 42 were un-contactable and 5 refused to answer the survey, which left us with responses from 33 patients.

Results

Of the 200 patients with foot and ankle injuries referred to the VFC, 82 (41%) were discharged with structured advice and 118 (59%) were referred to the outpatient fracture clinic for follow up.

Of these 200, 124 (62%) were female and 76 (38%) were male. Demographic distribution is as shown in Table 2. The injury distribution pattern and the percentage discharged are as shown in Table 3.

Table 1. Questionnaire used for telephone interviews

Questionnaire to Gauge Patient Satisfaction:
Rate the service 1-4 (Lowest to Highest: poor, average, good, excellent)
Did you return to the Hospital or GP with the same injury?
If yes, why?
Where you satisfied with the information given?
If no, did you receive a letter, leaflet and/or phone call?
How likely are you to recommend our service to a family member or friend if they were in similar situation? Extremely likely Likely Neither likely or unlikely Unlikely Extremely unlikely
Have you any suggestions for improvement?

Table 2. Injury patterns seen in the VFC and percentage discharged

Injury	Number	Discharged	% Discharged
Achilles Tendon Injuries	10	0	0
Ankle fractures	69	10	15%
Epiphyseal Injuries	3	2	67%
Soft tissue Injuries	30	21	70%
Talus fracture	3	1	33%
Phalangeal fractures	11	6	55%
Metatarsal fracture (1 to 4)	28	19	68%
5thMetatarsal fracture	33	22	67%
Mid foot soft tissue injuries	6	0	0
Calcaneal fractures	5	0	0
Nail bed Injuries	1	1	100%
Stress fracture metatarsal	1	0	0

Table 3. Table showing patient satisfaction with VFC service

Satisfaction of VFC service	No. of patients	Percentage of patients
1 (poor)	0	0%
2 (average)	2	6.06%
3 (good)	8	24.2%
4 (excellent)	23	69.7%

78 (95.1%) out of the 82 patients required no further follow up. 3 (3.65%) patients subsequently attended the fracture clinic on one occasion and 1 (1.21%) required two further clinic appointments.

Of the 118 patients referred for follow up, 3 were seen in other centres and thus had to be excluded from further analysis. This left us with 115 patients, of which 4 (3.48%) did not attend their follow up appointment, 33 (28.7%) attended one 33 (28.7%) attended two and 45 (39%) required 3 or more follow up appointments.

Of the discharged patients that re attended there were three fifth metatarsal fractures and one weber A ankle fracture. All these patients re attended due to persisting symptoms. Only one required follow up for 3 months till fracture union. All the others were reassured and discharged after one review.

Of the 33 patients who answered the survey, 93.9% of patients rated the VFC service as good or excellent, with no one rating the service as poor and 6.06% rating it as average. The mean score was 3.64 out of 4 and the modal score was 4 out of 4, with 69.7% of patients rating the service as excellent.

In addition, 97% of patients asked stated they were likely or extremely likely to recommend the service to a family member or friend in a similar situation, with the remaining 3% stating that they were unlikely to recommend the service.

Among the patients who were surveyed, 6% reported as being dissatisfied with the amount or quality of information they received. Despite this, all the patients who were dissatisfied with the information given regarding their injury via letter, leaflet and phone call, rated the overall service as a 3 or 4. The comments from these patients all indicated that they were unclear of the expected recovery time line for their injury and what they would be able to do and when. They remarked that clarification would have been helpful.

Discussion

From the above data it is clear that 78 of the 200 patients did not need a follow up but these patients would have increased the pressure on fracture clinic services in the absence of VFC. There are several

extremity injuries that do not need specialist treatment but continue to use up clinic capacity. Fracture of the base of the 5th metatarsal is one of these. It has been shown that outpatient follow up after 5th metatarsal injury was reduced by 78% after the introduction of VFC and appropriate patient education [5]. These researchers found no difference in non-union and operation rates before and after introduction of virtual fracture clinic.

Several studies have looked into patient outcomes after discharge from the virtual fracture clinic. Vardy et al studied the number of unplanned re-attendances to the A&E department within 7 days of discharge. They found that the number of unplanned re-attendances had not increased compared to the traditional management pathway [6]. A limitation of this study however, is that it does not pick up any patients presenting in A&E after 7 days or any longer-term complications caused by non-union. Similarly, in our series we had only 4 (4.87%) discharged patients re attending.

Jayaram et al studied 202 patients reviewed at a virtual fracture clinic with radial head and neck fractures over a 1-year period [7]. 10% of patients required a follow up clinic appointment and 90% were discharged with structured advice. The study found that patient satisfaction was high, and the re-intervention rate was very low, with only 1% of patients needing late surgical intervention.

Keating and White report from Edinburgh that their trauma unit has reviewed more than 30,000 referrals since they adopted this system in 20132. This has reduced the number of patients attending the traditional clinic by half. They had a dramatic decrease in patient complaints and are yet to identify a significant clinical error.

The British Orthopaedic Association has set out guidelines for fracture clinic services [8]. They recommend that following acute traumatic injury patients have to be seen in a fracture clinic within 72 hours in a consultant led clinic. It is therefore imperative that utilization of services has to be optimized. A virtual fracture clinic would go a long way in achieving this.

It must be emphasized that the treatment provided in this system is in no way inferior to the traditional form of treatment. The actual treatment is similar to that in a conventional clinic and the telephone conversation would be similar to that in a face-to-face discussion. The nature of injury and the treatment options are explained. The patient is allowed to ask questions and there must be certainty as to the expected outcome. The patient is given contact details to ring in case of any issues or when the outcome does not match expectations.

When such a completely new system is implemented the medico, legal aspect should also be looked into. It is important that this should not result in any harm to the patient and any risk of litigation to the health service professional involved, both of which are complimentary aims. The foundation of the modern law of medical negligence is in England the case of Bolam *vs* Friern Hospital management committee and in Scotland the case of Hunter Vs Hanley [9,10]. A practitioner is negligent if he or she acts in a manner in which no equivalent practitioner of ordinary skill would, when exercising reasonable care. If a practitioner follows standard practice or a national guideline formulated by a responsible body, this would be sufficient to discharge duty of care. Thus, adhering to a local or nationally agreed protocol the practitioner is able to reduce the risk of litigation substantially if not avoid it completely. The patient in this system gets the benefit of consistent standardised care in keeping with current best evidence.

The Virtual fracture clinic system in this country is still in its infancy and in a stage of constant evolution. It has the potential to deliver standardised evidence-based treatment based on local protocols. Our study shows that although in its early stages the VFC system is safe and effective. Discharged patients have good outcomes with a very low percentage returning to clinic for further review or needing subsequent X-rays. We are continuously reviewing these protocols to further streamline the system and improve its efficiency along with improving the quality of the verbal and written information provided (Figures 1 and 2).

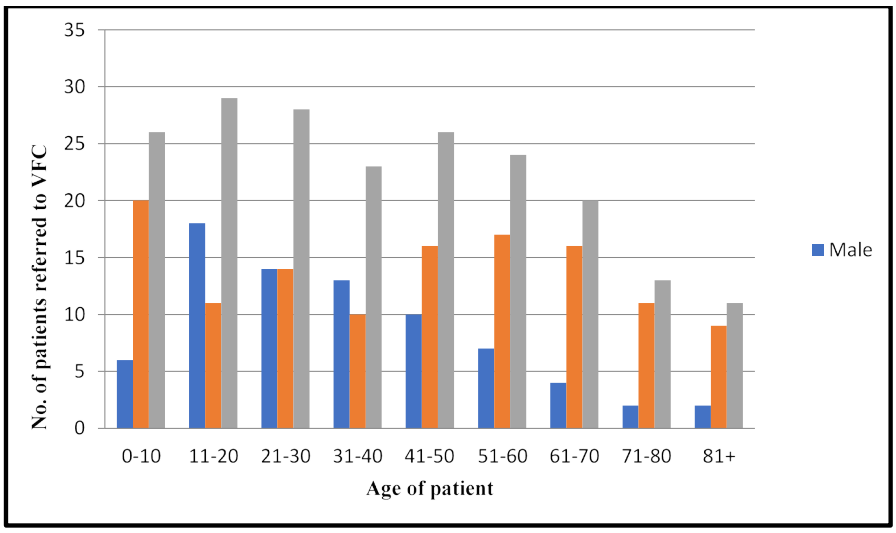

Figure 1. Demographic distribution of patients seen in the VFC

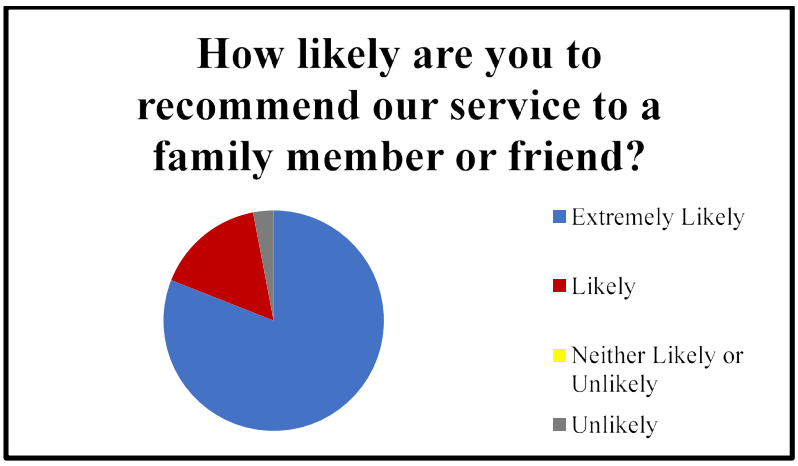

Figure 2. Pie chart showing the likelihood of patients recommending the VFC service to a family member or friend

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