EVALUATING CLINICAL OUTCOMES OF NAIL SURGERY

A RETROSPECTIVE AUDIT OF 80 PATIENTS USING PASCOM-10

RAVI KRISHAN
MODHA BSC (HONS) PGDIP (SPECIALIST PODIATRIST IN PODIATRIC SURGERY)

ANDREW LATHAM
BSC (HONS) (SENIOR SPECIALIST PODIATRIST & PODIATRY TEAM LEAD)

ERNEST BARLOW-KEARSLEY
BSC (HONS) FCPODS (CONSULTANT PODIATRIC SURGEON)

STUART HODDER
BSC (HONS) (SENIOR SPECIALIST PODIATRIST)

ALL - CENTRAL LONDON COMMUNITY HEALTHCARE (CLCH) NHS TRUST, DIVISION OF PODIATRY

Onychocryptosis is a common complaint within the scope of foot and ankle medicine, making up 5% of foot pathology managed by the podiatrist.[1-3] The condition often requires surgical management either as a primary form of treatment or when conservative measures fail to resolve the pain and recurrent infection associated with the malady.[4]

Within the armoury of podiatric medicine, nail avulsion with chemical matrix ablation, as well as the excisional matrixectomy, form the cornerstones of surgical intervention, evidencing patient satisfaction rates of around 90% through diminution of symptoms, acceptable cosmetics and low recurrence.[3, 5]

Within the landscape of podiatric practice as well as the evolving atmosphere of wider medicine, the importance of quality metrics and outcome measures is growing in stature, with an emphasis on quality and value the NHS particularly is becoming geared towards services being able to demonstrate clinical effectiveness. As a profession, podiatry is a vital cog in the wheel, keeping patients mobile and free of lower limb pain. However, much of what the profession is achieving remains unaccounted for, in part due to the prominent absence of quantitative outcomes in clinical practice through audit.

In 2010, the College of Podiatry rolled out the first web-based version of a revamped PASCOM-10 (P-10) system for use in podiatric surgery and podiatry, which is a validated tool measuring outcomes of those undergoing clinical procedures of the foot and ankle, with nail surgery being one such procedure.

STUDY AIMS

The aim of this study was to audit the outcomes using the P-10 system and evaluate clinical effectiveness in nail surgery within a community podiatry setting in central London. The intention is to demonstrate clinical effectiveness to a wider audience beyond podiatry, more specifically clinical commissioning groups (CCGs) responsible for electing the provision of local services (see Table 1).

Table 1: Three of the main KPIs evaluated to develop an understanding of how service users perceive the nail surgery service offered by podiatry and how it measures up against published averages

KEY PERFORMANCE INDICATORS
Surgical Site Infection (SSI)
Patient Satisfaction (Patient Reported Experience Measure or PREM)
Surgical Outcomes (Patient Reported Outcome Measure or PROM)

METHODS

The P-10 system was utilised in order to yield the necessary data for the audit. Two aspects of the system offering PREM and PROM data are the validated Manchester-Oxford Foot Questionnaire (MOXFQ) and the NHS Friends & Family Test (FFT).

MOXFQ is a 16-item tool developed for use in studies evaluating outcome measures in foot and ankle surgery, assessing how foot pathology impairs health-related quality of life and the effectiveness of intervention on pre-operative scores.[6] Within the realms of this study, data were collected pre- and post-operatively through the MOXFQ tool (see Table 2).

The NHS FFT is an important opportunity for services to feed back patient experience and satisfaction outcomes to NHS England.[7] It was first introduced in 2013, asking patients to report on whether they would recommend hospital wards and A&E services to their friends and family. With its initial success, it has been made widely available throughout the NHS for the same reasons, with services being able to entwine the test into their data collection methods to provide rich and meaningful statistics into the perception of the clinical intervention offered and service as a whole.

FFT test data were collected from patients at the point of discharge, following resolution of onychocryptosis. In total, this mid-term review details data from 80 patients who underwent nail avulsion surgery in a community podiatry setting between March and August 2015. The audit was registered with the NHS Trust it was conducted in and patients provided verbal consent to the data collection methods. Only nail avulsions using phenolisation of nail matrices are represented in the findings, as other techniques for matrix ablation are not standard operating procedure in the community podiatry department; excisional matrixectomy is also not included within the data collection due to the advanced nature of this procedure as a day case surgery in theatre.[8]

Patients were referred for surgery via formal referral internally by members of the podiatry team, where a patient failed conservative treatment for involuted nails or presented with an acute onychocryptosis. External referrals were accepted from a variety of

	Process	Stage	Timescale	Responsibility	Data Rationale
1	Create new patient entry on P-10	Initial assessment for surgery	N/A	Podiatrist Bands 5/6/7	To capture patient demographics and source of referral
2	Pre-op MOXFQ data input	Day of surgery	N/A	Foot care assistant Band 3	To capture pre-op MOXFQ score
3	Input procedure code & surgery details	Day of surgery	N/A	Foot care assistant Band 3	To capture details pertaining to the actual surgical procedure(s) undertaken, timing, medication supplied
4	Input of relevant post-op sequelae	Follow up appointments	1 week post-op initial review/redressing Any further follow up deemed clinically necessary	Podiatrist Bands 5/6/7	To capture any relevant post-op complications, diagnostic services utilised or medication supplied
5	Post-op MOXFQ and FFT data input	Final review	6-8 weeks post-op	Podiatrist Bands 5/6/7	To capture a post-op MOXFQ and FFT to compare with initial pre-op figures and understand patient experience

Table 2: The standardised five-step data entry process using th P-10 system in this audit

sources including general practitioners (GPs), district nurses, physiotherapists, hospital consultants and patient self-referrals. ASA (American Society of Anesthesiologists) rating was recorded at initial assessment on the P-10 system.

ASA 1 and some ASA 2 patients were clinically assessed and referred conventionally for nail surgery in line with current departmental guidelines. Some ASA 2 and all ASA 3 patients were to be referred for further evaluation and consideration of their potential wider medical problems, making use of links to local vascular, rheumatology, haematology and diabetology services, inclusive of GP patient management. Once re-assessed and deemed appropriate for surgery, high-risk patients could also be listed for nail surgery.

All surgeries were performed by a specialist podiatrist and foot care assistant, under a standard local anaesthetic digital block of the required digit(s) using 3% mepivacaine, and haemostasis was achieved with the appropriate sized single-use Tornicot™, enabling chemical matrix ablation with 80% phenol.

The partial nail avulsion procedure was undertaken in line with local guidelines, utilising an a strict aseptic non-touch technique (ANTT) with the use of pre-operative povidone iodine (10%) tincture or chlorhexidine 4% applied to the patient's foot, sterile drape, sterile gloves and sterile single-use surgical tools.

After careful elevation of the nail plate, the offending spike or involuted spear of nail was resected to the level of the nail matrix using an SM61™ blade and mosquito forceps. In the case of total nail avulsion, the entire nail was removed as one segment. A pre-ablation masking of the peri-sulcus and entire dorsum of the hallux was undertaken using a nail elevator and sterile petroleum jelly. Chemical ablation with 80% phenol was then undertaken, being applied for three intervals of 60 seconds per nail sulcus, which was then swabbed and flushed with five full sprays of 0.5% chlorhexidine, carefully protecting the rest of the hallux with sterile gauze to prevent phenol leaching. Any residual hypergranulation tissue was removed using mosquito forceps.

Dressings consisted of: Inadine, Melolin, Kaltostat, Sterile Gauze (x3), Tubegauze size 12 and Mefix hypoallergenic medical grade tape, and were applied using the ANTT process.

The patient was advised to rest and keep the dressing on and dry until their first post-operative review after seven days, applying additional sterile gauze in the presence of strikethrough bleeding. The standard departmental post-operative advice sheet was issued inclusive of advice for the occurrence of increased pain, excessive bleeding, malodourous strikethrough, and use of over-the-counter medication such as paracetamol 500mg for pain relief.

At the initial post-operative review after seven days, a standardised approach to clinical evaluation, redressing and advice was undertaken. The post-operative wound sites were assessed for the presence of suspected surgical infection (SSI) and recorded on the P-10 system: erythema, calor, purulent discharge, pain and swelling. Phenol burn, excessive bleeding, onycholysis, sub-ungual haematoma and any relevant antibiotic therapy required was also recorded.

With the ASA 3 patients, continual weekly review until final discharge was undertaken in line with local guidelines, with the patient responsible for redressing and saline bathing in sterile water the post-operative sites daily, in between review sessions. If the patient acquired a SSI they were also monitored weekly in the same manner. The ASA 1 and ASA 2 patients were required to undertake their own daily saline cleansing and redressing, with careful monitoring for signs of delayed healing or infection, which were outlined to all patients who underwent surgery. A strict ANTT redressing technique was demonstrated to all patients using a povidone iodine sterile dry spray and a non-adherent Mepore sterile woven island dressing.

The standard request for empirical antibiotics was 500mg flucloxacillin QDS in line with local microbiology guidelines for SSI in minor podiatric surgery. In the presence of penicillin drug allergy, local guidelines advised a macrolide antibiotic as the next line drug of choice. In this audit no patients required antibiotic prophylaxis after being assessed medically with the clinical decision based on the professional opinion of the specialist podiatrist after liaison with the patient's GP or hospital consultant, in line with local guidelines.

RESULTS

The data were analysed using the built in online P-10 software, yielding the outcomes of this study.

Surgical Activity

A total of 80 patients underwent partial or total nail avulsion, with bilateral

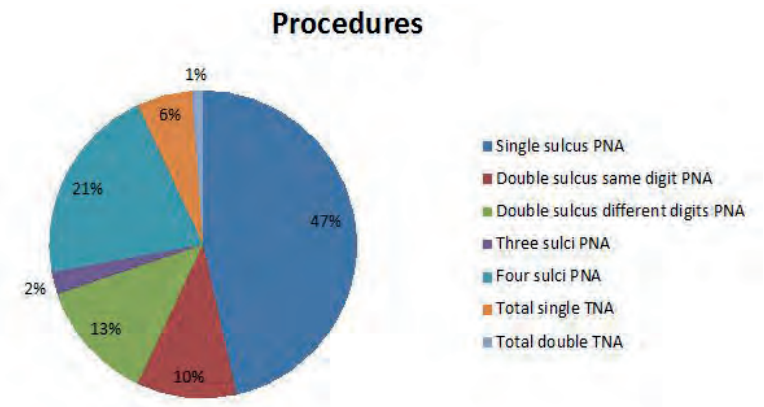

Figure 1: Breakdown of procedures undertaken

Figure 2: Referral Sources for nail surgery to the community podiatry department

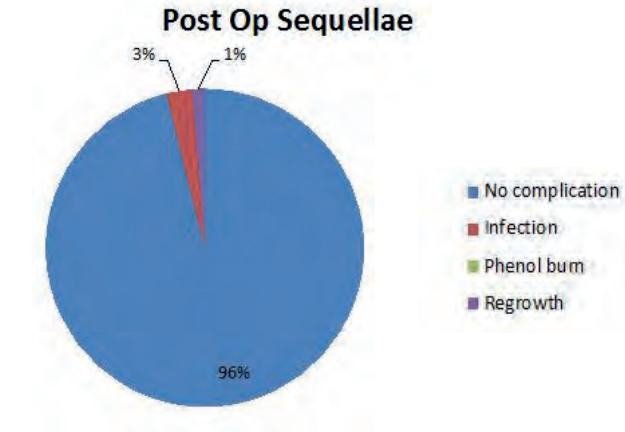

Figure 3: Observed Complications

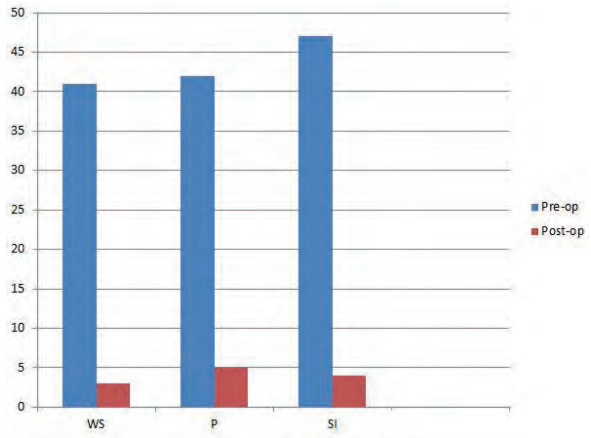

Figure 4: Pain, Weightbearing and Social Impact evaluation using MOXFQ recorded both pre & post operatively as a valid outcome measure of the nail surgery intervention, a dramatic reduction in these measures is observed indicating a positive surgical intervention

hallucal partial nail avulsion being the most frequently undertaken procedure (see Figure 1). The average tourniquet time was 0-14 minutes (95%), with the remainder of procedures falling under the 15-29 minute bracket, though no procedure was recorded to have exceeded 16 minutes.

Patient Demographics

The majority of patients referred for nail surgery were ASA 1 (90%), with ASA 2 (10%) and no ASA 3 patients undergoing surgery in this time period, though they were included in the study design.

A total of 59% of patients fell into the male demographic, with the mode age range being 10-14 years old in males and 55-59 in females. The most common referral source was via the patient's GP (82%). (See Figure 2.)

Post-op Sequelae

A total 96% of patients healed post-operatively with no complications (see Figure 3). SSI was recorded in 3% of patients who underwent surgery and infection was cleared with a single course of empirical antibiosis in 100% of patients. Regrowth of nail spike(s) was recorded in 1% of cases (one sulcus in a bilateral hallucal double sulci partial nail avulsion). No phenol burns were observed in any of the 80 cases.

Outcome Measures

Using the MOXFQ, all outcome measures inclusive of walking and standing ability (WS), pain (P) and effect on social interaction (SI) were significantly reduced post-operatively in this group (see Figure 4).

The MOXFQ consists of 16 items. Response options consist of a five-point Likert scale ranging from no limitation to maximum limitation. Scores for each domain are calculated by summing the responses to each item and converting to a 0-100 metric, where 100 = most severe. The data were pooled, and the average scores remained below 50 for the three domains, though an obvious decrease in walking and standing ability (WS), pain (P) and effect on social interaction (SI) was observed.

MOXFQ SCORE PRE & POST OPERATIVELY

The FFT evidenced an excellent recommendation score of 96.8%, with either patients who underwent surgery to be extremely likely (62.5%) or likely (34.3%) to refer a friend or family member to the institution for partial/total nail avulsion surgery (see Table 3).

DISCUSSION

Post-operative infection has been acknowledged as a clinical condition caused by the action of pathogenic microorganisms within the surgical site, with the cardinal signs of inflammation,

How likely would you be to recommend a friend or family member to this service for similar treatment?	COUNT
Extremely likely	40
Likely	22
Neither likely nor unlikely	1
Unlikely	1
Extremely unlikely	0
Don't know	0

Table 3: Raw data for FFT collated at the point of discharge

erythema, calor, oedema and pain represented as (bacterial dose x virulence) / by host resistance, and therefore the relative microbial count at the site of surgery will inevitably play a role in the development of SSI.5

Published audits of accepted SSI rates in clean foot and ankle surgery have varied from 1% to 5% 9-11 and with pertinence to nail surgery have been less conforming.[2, 5, 12, 13]

Three categories of surgical contamination have been proposed: clean, clean-contaminated and contaminated.[10-11] Elective foot and ankle procedures, in which the majority of acceptable SSI rates have been proposed, are classified by the category of clean surgery under sterile skin conditions.[5, 10]

However, several studies have demonstrated nail folds consistently demonstrating a high concentration of microbes within the surgical site even after application of decontaminating tincture,[5,14] with cultures of 84% pathogenic microbes in the site of nail surgery in comparison to only 22% cultured from the ankle.[15-17] Bibbo and colleagues evidenced specifically the superiority of pre-operative skin preparation in foot and ankle surgery with chlorhexidine in comparison to povidone iodine tincture.[18] Some literature suggests that skin cannot be truly sterilised and can only be made surgically clean, reducing the bacterial load within the site of surgery.[5, 19]

It is with these considerations that it may be considered that, as with a high concentration of pathogenic microbes within the site of surgery in the nail avulsion procedure, this should be classified as a clean-contaminated foot and ankle surgery, as opposed to clean foot and ankle surgery[5]

Within this study, skin preparation was undertaken using povidone iodine (10%) tincture and the data suggest that the 3% rate of infection is still in line with accepted infection rate in clean foot and ankle surgery, despite the probability that nail surgery is not an actual clean surgery,[17] thus significantly enhancing the credence of the low SSI rates yielded within the study. In combination with a low incidence of recurrence and no other post-operative sequelae in all 80 cases, the study is able to demonstrate a high level of patient safety and clinical effectiveness as well as quality outcomes when considering the MOXFQ and FFT data.

It is interesting to note that the majority of referrals were sourced via patients' GPs, a profession who make up the majority of the modern day CCGs.[7] It is then exceedingly opportune to feed back these successful outcomes to those with responsibility for commissioning and monitoring service provision within the community setting, enhancing the relationship between the podiatry profession and the wider healthcare field.

It should be noted in collecting the data in this audit that 16 patients were lost to follow up post-operatively, meaning their immediate post-operative sequelae were recorded but the outcomes pertaining to post-operative MOXFQ and FFT were underreported in this aspect of data analysis. This is an obvious limitation of the study design.

CONCLUSION

With the changing landscape of the NHS and the advent of AQP (Any Qualified Provider), the significance of being able to demonstrate effective, safe and quality delivery of services has amplified within healthcare.

The current figures yielded by this study provide quantitative data that the podiatry department undertaking the audit can use to showcase its effectiveness in clinical practice to the commissioners responsible for organising care within the locality. Moreover, it will serve as a benchmark for future audit into the outcomes of nail surgery within the community setting against which service development can be measured. The authors advocate its transition into routine practice for all NHS-led podiatry services offering nail surgery for these reasons. ■

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