Outcomes from day case surgery performed by one podiatric surgeon during the COVID-19 pandemic in patients from a multidisciplinary diabetic foot clinic

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Background

The management of diabetic foot ulcers was challenging during the COVID-19 pandemic due to the difficulties in seeing and treating high-risk patients in person and service challenges through staff redeployment. There is significant overlap between risk factors for morbidity and mortality from COVID-19 and risk factors for diabetic foot disease.[1,2] The vascular wards had become COVID wards and any hospital admission was at risk of nosocomial acquired COVID-19 infection. Patients who might previously have been admitted for intravenous antibiotics, vascular investigations and inpatient surgery were predominantly managed as outpatients. Vascular intervention was deferred where possible. More day case surgery was undertaken in place of inpatient surgery. During surgery ulcer and bone sequestra were debrided and the remaining bone was fenestrated and packed with highly purified calcium sulphate impregnated with vancomycin 1g and gentamicin 80mg. We started using this technique in 2010 and we have previously reported that it is effective in preventing more radical surgery.[3-5] It is used early in the treatment pathway. Intraoperative bone samples were sent to microbiology.

Aim

It was unclear whether the change in management necessitated by COVID-19 was associated with any significant worsening of wound healing and overall patient outcome. The aim of this review was to audit the outcomes in patients who underwent day case procedures performed by a single podiatric surgeon during periods of local and national restrictions.

Method

This was a retrospective review of all patients operated on by a single podiatric surgeon in day case surgery at community hospitals in Leicestershire. Operations were undertaken between 27th March, 2020 and 22nd March, 2021. Patients had to be ambulatory and had to have someone drive them to the hospital and provide aftercare. The operation was done under local anaesthetic. We collected data on age at time of operation, gender, diabetes, last recorded glycosylated haemoglobin (HbA_{1c}) value, date of operation, type of procedure, site of operation, vascular status, microbiology growth and outcome at 28 days post-procedure. An ulcer was considered to be healing if there were signs of healthy granulation tissue, there was a decrease in size and depth with no evidence of infection and an improvement in appearance compared to the pre-operative appearance. Data were collected using the hospital's clinical record systems.

Results

140 day case procedures were performed on 121 different patients. Full demographic details can be seen in table 1. Of the patients 98 were male and 23 were female; the mean and median age was 64 years. In all, 114 patients had a diagnosis of diabetes. Procedures were predominantly digit amputation, joint resection or soft tissue debridement: 73 operations were undertaken on toes, 19 on metatarsal phalangeal joints and 32 on metatarsals. Seven operations were undertaken on the midfoot and a further nine on the heel. Outcomes 28 days post-procedure showed that 79 patients (56%) had completely healed, a further 51 (36%) were still healing and 10 (7%) had deteriorated, requiring further surgery or other definitive treatment. No patients required inpatient admission for foot surgery within the 28 days post procedure. Mean HbA_{1c} in patients with diabetes was 69mmol/L. Sixty percent had no evidence of peripheral

Table 1 Demographic Details

Demographics	Number	% of total
Gender		
Male	98	81.0
Female	23	19.0
Age (years)		
Below 40	3	2.5
40 to 50	9	7.4
50 to 60	41	33.9
60 to 70	50	41.3
70 to 80	4	3.3
Older than 80	14	11.6
Diabetes		
Diabetes	114	94.2
No diabetes	7	5.8

Figure 1. Outcomes 28 days after all procedures

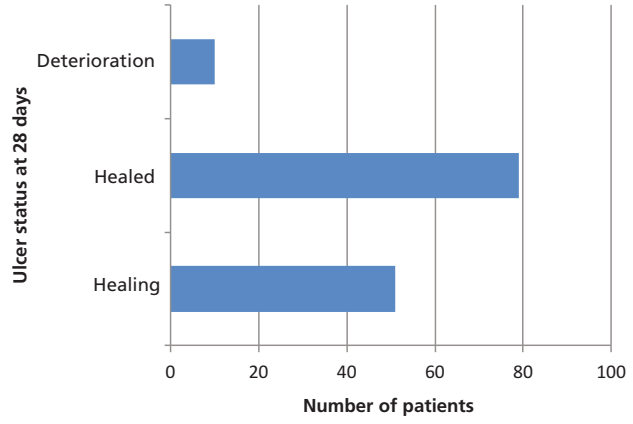
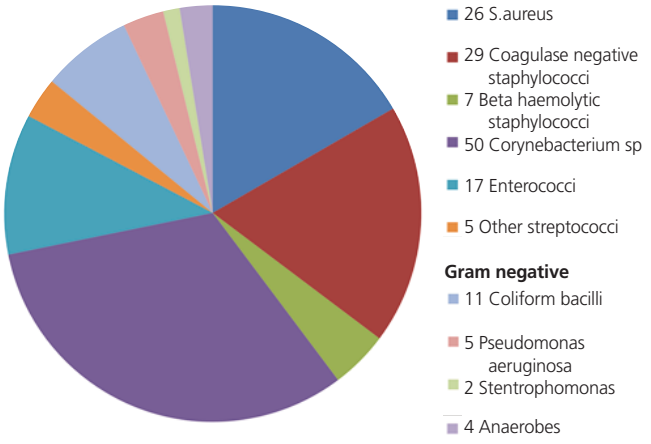


Figure 2. Primary culture results from bone removed at the time of surgery



vascular disease, 20% had evidence of vascular insufficiency and in 20% vascular status was not documented but the patients probably had satisfactory circulation which had not been recorded in the medical records. More patients with impaired vascular status had deterioration after 28 days (11%) compared to those with no vascular impairment (5%). At the time of data collection in March 2022, nine of the 121 patients had died (7%). Data collection was undertaken 12 to 24 months after the initial surgical intervention. No deaths were attributed to diabetic foot disease.

The most common organisms grown were *Staphylococcus aureus* (21%) and *Corynebacterium striatum* (13%). Of the bone cultures, 48 were monoculture (45/48 Gram positive) and 35 were polymicrobial (20/35 were a mix of Gram positive with Gram negative bacteria and 15/35 were polymicrobial Gram positive). Twenty-one bone samples (15%) showed no growth. All but 12 patients had received systemic antibiotics pre-operatively: of these patients nine had a healed ulcer at 28 days post operatively and the remaining three were healing. The 12 patients who did not receive antibiotics were a heterogeneous group - multiple antibiotic intolerances, cultured organisms only sensitive to intravenous antibiotics and patients who had deformity preventing ulcer healing.

Conclusions

An increase in day-case surgical intervention with antibiotic-impregnated calcium sulphate (a change in practice necessitated by the COVID-19 pandemic) can be safe and can prevent an inpatient stay without later risk of major amputation. The change has continued despite the end of the COVID lockdown due to patient preference and the decreased costs associated with outpatient treatment. Some patients with severe diabetic foot disease or critical limb ischaemia were still admitted so the findings cannot be generalised to all patients in our diabetic foot clinic.

These operations were predominantly on the forefoot in people without vascular insufficiency, which is likely to improve the success rate. Procedures on seven patients without a history of diabetes shows that diabetic foot clinics can care for people without diabetes where no other service may exist.

The number of deaths from non-diabetic foot disease in the patients operated upon and reviewed here shows the significant burden of co-existing medical conditions in patients with diabetic foot disease requiring surgery. These patients would have been at greater risk of mortality had they been admitted to hospital.

These data was presented as a poster at the Diabetic Foot Study group (DFSG) in Bratislava, Slovakia, 16-18 September 2022, and won the poster prize.

Conflict of interest None.
Funding None.

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