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Ambulatory forefoot day-case surgery

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We report on our early experiences of performing a variety of forefoot procedures under local anaesthetic as outpatient, ambulatory cases. This new approach may represent a considerable cost saving on previous methods as well as improved convenience for patients. Regional anaesthesia using an intermetatarsal block with a dental syringe and silicone coated needle has simplified the anaesthetic technique and is less painful than using standard hospital disposable syringes and needles. All patients were treated within 2 h of the administration of the local anaesthetic. A bloodless field was achieved with a custom-made ankle tourniquet and the use of bipolar diathermy. Postoperative pain control was achieved by the administration of supplementary long acting bupivacaine into the wound and oral proprietary analgesics in the postoperative period.

Key words: Ambulatory, local anaesthetic, surgery, foot, podiatry

Introduction

Recent NHS reforms have encouraged the increased use of outpatient and day-case surgery. Routine forefoot surgery represents a large part of orthopaedic practice and is generally performed under general anaesthesia on an inpatient basis.

This is highlighted in many studies, one of which reported on 10 348 patients treated in a day surgery unit, where only 757 (7%) were orthopaedic cases¹. Of these orthopaedic cases 0.8% were readmitted with post-operative complications such as vertigo or drowsiness related to general anaesthesia.

The move towards day-case and outpatient surgery is a topical area of debate in the future provision of surgical services in the UK. Targets of as much as 60% for all surgery being performed on a day basis by the year 2002 have been suggested². Much forefoot surgery necessitates hospital admission but we feel there are opportunities for further development of day surgery in this group.

Forefoot surgery has been carried out using regional intravenous anaesthesia^{3,4}, ankle block^{5,6} and midtarsal block⁷. Turbutt⁸ reported on 325 procedures carried out in a Foot Day Surgery Unit using local anaesthetic blocks. Considerable interest has been shown by health purchasers in this unit. We have been offering an ambulatory, forefoot, day-case surgery service with the cooperation of a podiatrist and an orthopaedic surgeon. We

have found that adequate analgesia can be achieved by the technically easy Mayo Block^{9,10} for first metatarsal surgery, and intermetatarsal or digital blocks for the lesser toes.

Methods

When patients are booked for surgery the procedure and anaesthetic technique are explained and consent obtained. Guidelines on the selection of patients suitable for day-case surgery are used when assessing the patients' suitability for this type of service^{11,12}. Those patients unsuitable or who decline this method of treatment are booked for routine surgery under general anaesthesia.

On the day of operation patients are asked to wash the foot with antiseptic soap. The local anaesthetic is given after the foot has been prepared with an antiseptic solution. The use of silicone-coated 27-gauge needles used in conjunction with a self-aspirating dental syringe allow for less painful administration of the local anaesthetic.

For first ray surgery confined to the distal half of the metatarsal and toe a Mayo block is given. Two or three 2.2 ml vials 4% prilocaine hydrochloride are used. This block is achieved in two stages. First, the base of the first intermetatarsal space is palpated and the dental needle inserted into the space to block the dorsal intermetatarsal nerves. It is then advanced deeply to block the plantar nerves. It is inclined at 60° to the horizontal to avoid the plantar penetrating branch of the dorsalis pedis artery (*Figure 1*). Second, the needle is inserted



Figure 1 Mayo block being inserted around the base of the first metatarsal. Tourniquet in position prior to inflation.

and advanced around the medial side of the first metatarsal just below the skin. Injection of anaesthetic here blocks the most medial branch of the medial plantar nerve and terminal fibres of the long saphenous nerve.

By operating on one foot only, dosages are kept well within the recognized maximum safe limits. For lesser toe procedures an intermetatarsal or digital block is employed. Between 15 and 30 min is allowed to ensure adequate analgesia has developed. If necessary local infiltration of anaesthetic can be administered to supplement an inadequate block during surgery. Because the periosteum contains the sensory nerve supply of the overlying skin, bone is adequately blocked and the use of a powered oscillating saw is possible for osteotomies.

Once analgesia has developed, a custom-made tourniquet is applied. This tourniquet is designed to be applied around the ankle and incorporates a cushion to compress the posterior tibial vessels posterior to the medial malleolus. The limb is elevated and exsanguinated with an Esmarch bandage and the tourniquet inflated¹³. We have found that this can be applied painlessly at pressures of 100 mm Hg above systolic for up to 1 h. It has been found to be less painful than a calf or supramalleolar ankle tourniquet.

The foot is prepared as for routine surgery under general anaesthesia. The surgical technique is not altered except for the use of bipolar diathermy to coagulate vessels. In particular, attention is paid to superficial veins along the dorsal aspect of the foot and toes. Wound closure is followed by the administration of between 0.5 ml and 1.0 ml of 0.25% bupivacaine hydrochloride either into or proximal to the wound using a standard disposable syringe. This provides up to 8 h local postoperative pain relief.¹⁴

After the procedure the patient is kept semi-supine, offered a hot drink and observed for half an hour to ensure arterial return and to assess the degree of postoperative haemorrhage before being allowed home. They are fitted with a postoperative shoe where this is appropriate and instructed to keep the foot elevated and take regular non-demand analgesia such as co-codamol for 24–48 h commencing 6 h after the operation. In this way, severe postoperative pain is avoided¹⁵. A district nurse visits the patient after 2 days when the dressings are reduced and the wound inspected.

Results

To date, over 50 procedures have been performed in this way. Table 1 shows the range of procedures that have been carried out. There have been no wound infections and no significant complications. One patient required admission 8 h after surgery for pain control.

Discussion

Podiatric surgery is widely practised in North America. In the UK state registered chiropodists or podiatrists are involved in multidisciplinary clinics and within the structure of the changing National Health Service are being referred patients for forefoot surgery.

The cooperation of the podiatrist and orthopaedic surgeon in this situation has been very beneficial. The combination provides an input of complementary professional ideas and techniques which serve to provide the patients with an improved service with short waiting times.

Table 1. Local anaesthetic, ambulatory procedures carried out

First metatarsal
Excision arthroplasty
Distal osteotomy
Metatarsophalangeal fusion
Exostectomy
Bursectomy
Extensor hallucis lengthening
Nail bed ablation
Lesser toes
Hemiphalangectomy
Interphalangeal joint fusion
Amputation
Flexor and extensor tenotomy
Soft tissue
Excision of ganglion
Excision of swelling

Ambulatory foot surgery is well recognized¹⁶. Addino¹⁷ reported a year's experience of outpatient foot surgery in a podiatric hospital with 79.9% of complication-free cases. This was at the expense of very high levels of patient follow-up.

Infection in this type of outpatient surgery is within acceptable limits. Addino¹⁷ reported a rate of 2.1%, Martin¹⁸ 1.3% and Hugar¹⁹ 1.35%. This compares very favourably with infection rates recorded by Stevens²⁰ of 5.34% and 2.2% by Miller²¹ with inpatient foot surgery. We would however stress the importance of the patient selection procedure as many patients perceived that operation should be carried out under general anaesthetic. Many elderly patients however were enthusiastic about regional anaesthesia rather than a general anaesthetic.

Burn²² has suggested that day-case surgery could reduce costs by 75% on inpatient levels. Nevertheless, Stott²³ suggested that this fails to take into account the heavier demands that such a service places on ambulance, district nursing and GP services.

We believe that such transfer costs are more than offset to a purchaser by the cost effectiveness of an ambulatory day-case service run by a multidisciplinary team of podiatrist and orthopaedic surgeon. We are continuing to work with this new approach to build up a much larger number of cases. With audit of the service we hope to establish the efficacy of this approach and formalize a cost structure per case.

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