CHAPTER 39

EFFECT OF POSTOPERATIVE DRESSINGS ON ACUTE POSTOPERATIVE PAIN LEVELS IN FOREFOOT SURGERY

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INTRODUCTION

The hallux abducto valgus (HAV) deformity of the first ray is one of the most common pathologies treated by the foot and ankle surgeon and it often requires surgical correction. The amount of postoperative pain experienced after surgical correction is of considerable concern to both the patient and the surgeon (1). Opioid analgesics are effective in pain management, but are associated with many potentially severe adverse effects (2). Limiting the need for postoperative analgesics has the potential to decrease these adverse events and their associated cost (3).

The surgeon correcting the HAV deformity has a large variety of surgical approaches and fixation techniques to choose from. While this leads to significant variability of technique between surgeons, one constant among them is the application of a postoperative dressing. Nearly ubiquitous in podiatric surgical training is the anecdotal instruction that the postoperative dressing can affect the amount of acute postoperative pain experienced by the patient. Despite this, no research on the effects of the postoperative dressing on pain was found in the medical literature by the authors. This study is an attempt to identify any effect that surgical dressings may have on postoperative pain levels.

METHODS

Subjects between the ages of 18-72 years were selected from the patients who underwent an Austin bunionectomy by one of four attending surgeons (MH, JA, LS, AG). All subjects had the primary diagnosis of HAV and had not received any form of previous surgical correction. Exclusion criteria included diabetes mellitus, rheumatic disease, vascular disease, neuropathy, pain syndromes, and smoking.

A total of 551 subjects met the criteria and were divided into either the attending group or the fellow group. The attending dressing group (n = 257) had the initial postoperative dressing and first dressing change at the first week follow-up appointment applied by the attending surgeon. The fellow group dressing group (n = 247) had their dressings applied by one of three fellows of the surgeon's foot and ankle surgery fellowship. The dressing technique and application were not standardized among the participating surgeons. There were 47 exclusions for failure to follow the study protocol, leaving 504 subjects enrolled in the study.

The postoperative course was standardized with immediate weightbearing in a cam walker boot and oxycodone/acetaminophen 7.5/325 mg for pain control. Pain level was measured using an 11-point visual analog scale (VAS; range 0-10) at 2 weeks postoperatively. The values were recorded for pain experienced during both weightbearing and non-weightbearing. End points were the need for a prescription pain medication refill and VAS pain ratings.

RESULTS

The visual analog scores were significantly lower for the attending dressing group compared to the fellow group for both weightbearing ($P < 0.001$) and non-weightbearing ($P < 0.001$). The attending group required less prescription refills with 24% of the attending group requiring refills compared to 49% of the fellow group. These results indicate a statistically significant decrease in postoperative pain in the attending dressing group (Table 1, Table 2). To ensure that surgeon technique was not a confounding factor of the postoperative pain levels, surgeon specific pain level comparisons were completed. None of the surgeon comparisons yielded significant pain differences (Table 3). No significant difference or correlation among groups was found for postoperative complications. Complications for the attending group included 13 skin infections, 4 incision dehiscence, 10 hardware removals, and 1 delayed union. Complications for the fellow group included 10 skin infections, 8 incision dehiscence, 7 hardware removals, and 3 delayed unions. None of these complications required patient withdrawal from the study. All procedures went on to full healing, and no revision surgeries were necessary (Table 4).

DISCUSSION

The principal finding from this study, that there is a statistically significant decrease in pain levels experienced by patients who have dressings applied by the more experienced attending surgeons, confirms that dressings and their application are a determinant of acute postoperative pain levels. This is consistent with the anecdotal instruction common in podiatric surgical training that attention should be paid to dressing application to reduce pain experienced postoperatively. While the postsurgical dressing may seem a trivial aspect of the procedure, it is the one constant among all surgeons and optimizing it can have benefit.

The second significant finding is that this decrease in pain levels correlates to a nearly 50% reduction in the amount of opioid analgesics needed for pain control. This is possibly the more remarkable finding of the two as it has the potential to promote patient safety and improve outcomes through reduction of opioid use. Decreasing the risk of opioid-related adverse events is particularly desirable as most foot and ankle surgeries take place in the outpatient setting.

The primary goal of postoperative pain management is to enhance patient comfort and facilitate the recovery process, thereby decreasing postoperative complications (4). Although opioids are very effective in managing pain, they are not without adverse effects that are potentially severe (2). They are also very common, with as many as 50% of patients experiencing some form of adverse effect (1). It has been reported that opioids are responsible for nearly 60% of all perioperative adverse drug events (5). This leads to increases in cost due to the possible need for additional medications, additional personnel, and hospital admissions (3). While opioids are still the cornerstone of postoperative pain control, multimodal approaches are gaining popularity as they decrease the overall need for opioid use (6). Still, these additional medications are not without adverse effects themselves (7). Our study suggests that there is potential for decreasing the overall need of these medications as greater care and experience are exercised in dressing application.

Uncontrolled postoperative pain is one of the most frequent adverse events occurring after ambulatory surgery and is associated with delay in return to normal daily function (8). A study by Peters et al (9) showed that the most important predictors of long-term postsurgical outcome were ASA grade, acute postoperative pain, and duration of surgery. The study found that a higher level of pain at postoperative day 4 was associated with a higher incidence of chronic pain at 6 and 12 months, poorer levels of physical functioning, and a decrease in the level of patient perceived global recovery. A previous study by the same authors found the same correlation with decreased quality of life scores (10). As noted by the authors, the amount of acute postoperative pain is a potentially malleable factor related to poorer outcomes. Our study suggests that the postoperative dressing has a role in decreasing this malleable factor, potentially improving long term outcomes.

A strength of this study is the large number of subjects and surgeons participating. The differences in the VAS values for both study groups were relatively small (0.5 points for non-weightbearing and 0.7 points for weightbearing) even though statistically significant differences were able to be identified. This is likely because of the large number of subjects participating. The bunionectomy is the most common pain model used for assessing new analgesics because it produces consistent and durable acute pain that requires several days of recovery time (11), and using it as the procedure in this study is a strength. Obtaining VAS values only once at 2 weeks is a possible weakness of the study. The previously-mentioned studies have shown that the pain level at day 4 is predictive of outcomes (9,10). It would be beneficial for future studies on this topic to include pain levels at day 4 as well.

In conclusion, our results demonstrate that postoperative dressings can have an effect on acute postoperative pain levels. The lack of standardization of dressing application prohibits any specific recommendations on dressing techniques. What can be shown from the results is that there is a statistically significant difference between dressings applied by fellows and those applied by the more experienced attending surgeons. This difference was statistically significant for all endpoint values obtained ($P < 0.001$), as well as a 50% reduction in opioids needed postoperatively.

Table 1. Average visual analog scores*

Group	Non-weightbearing	Weightbearing
Attending	3.6	5.1
Fellow	4.1	5.8

*All P values < 0.001

Table 2. Precription Refills

Group	Patients	Refills	Percentage
Attending	257	61	24%
Fellow	247	121	49%

Table 3. Surgeon-specific pain comparisons*

Surgeon	NWB *P* value	WB *P* value
A/B	0.0107	0.61
A/C	0.05	0.95
A/D	0.32	0.66
B/C	0.70	0.64
B/D	0.15	0.93
C/D	0.34	0.70

*NWB = non-weightbearing; WB = weightbearing

Table 4. Complications

Complication	Attending (n=28)	Fellow (n=28)
Skin infection	13	10
Incision dehiscence	4	8
Harware removal	10	7
Delayed union*	1	3

*All osteotomies went on to union

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