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Retrospective Evaluation

Efficacy of Fluoroscopically Guided Steroid Injections in the Management of Coccydynia

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Background: Coccydynia is a rare but painful disorder characterized by axial coccygeal pain which is typically exacerbated by pressure. Management includes physical therapy/rectal manipulation, use of anti-inflammatory medications, modality use, coccygectomy, and fluoroscopically guided steroid injections. There are no studies documenting the efficacy of fluoroscopically guided coccygeal steroid injections in patients with coccydynia.

Methods: Retrospective chart review was used to collect data on 14 consecutive patients diagnosed with coccydynia who underwent a fluoroscopically guided coccygeal injection of 80 mg triamcinolone acetate and 2mg of 1% lidocaine over a 3-year period at a tertiary care academic medical center.

Results: Using stepwise logistic regression, acute pain was determined to be the best predictor of relief. Fisher's exact test showed that those patients with pain lasting less then 6 months were significantly more likely to have greater than 50% relief (P=0.055). Patients with chronic pain longer than 6 months were not found to have pain relief of >50% to any statistical significance, but every patient with acute pain showed improvement.

Conclusion: Patients with acute pain (less then 6 months) are more likely to respond to fluoroscopically guided coccygeal steroid injections.

Key words: Coccydynia, steroid injection, fluroscopy.

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Historically, coccydynia has been a controversial topic. In the nineteenth century, Bremer had attributed much of the symptoms associated with coccydynia to anxiety, neurosis, and hysteria (1). The condition is a rare but painful disorder characterized by axial coccygeal pain which is typically exacerbated by pressure. Often times the pain is experienced with prolonged sitting. The condition has been attributed to a history of trauma, childbirth, immobility of the sacrococcygeal junction, degenerative sacrococcygeal changes, and presence of coccygeal spicules (2-6).

Management includes physical therapy/rectal manipulation, use of anti-inflammatory medications, modality use, coccygectomy, and fluoroscopically guided steroid injections. Patients with chronic

refractory coccydynia may undergo a coccygectomy. A fluoroscopically guided steroid injection is a more conservative treatment and offers less risk to the patient. There are few outcome studies examining the efficacy of steroid injections in coccydynia, and none documenting the efficacy of a fluoroscopically guided injection.

The objective of the study was to determine the efficacy of fluoroscopically guided coccygeal steroid injections for the treatment of coccydynia.

Methods

Retrospective chart review was used to collect data on 14 consecutive patients diagnosed with coccydynia who underwent a fluoroscopically guided coccygeal injection of 80 mg triamcinolone acetate and 2 mL of 1% lidocaine over a 3-year period at a tertiary care academic medical center (see Table 1). The sacrococcygeal junction was the primary injection site where half of the injectate was administered (Fig.1); the other half was placed periarticularly over the posterior aspect of the coccygeal segments. Patients were excluded from the study if they did not follow up after the procedure. Pre-injection Visual Analog Scale (VAS) and post-injection VAS on the day of the injection and at 3-week follow-up were documented.

Data from 14 patients was used in the analysis. The covariates used were age, race, gender, and concomitant use of opioids, trauma, chronic pain (lasting more than 6 months), use of lidocaine patch, and use of a doughnut cushion. None of the 14 patients had received physical therapy with intrarectal coccygeal manipulation. A multivariate logistic regression analysis was employed to determine the relationship between coccygeal steroid injections and improvement; with improvement being defined as 50% or greater relief. One patient received the injection multiple times, and only data from the first visit was used. For patients that gave a range in VAS at any time, the mean number was used. One patient did not have available data at 3 weeks; because of the low power of the study the data point at 2 weeks was included as it was the best data available. Two patients had multiple data points for post 3 week VAS, the average number was used.

Fig. 1. Fluoroscopic image of coccygeal injection.

Table 1: *Baseline Characteristics of Patients Undergoing Sacrococcygeal Steroid Injections*

Variable	Percentage (N=14)
Mean age	43.4 (range 35 – 64)
Gender	50% male, 50% female
Race	71% Caucasian, 7% Asian, 7% Black, 7% Native American, 7% other
Opiod Use	28.6% (n=4)
History of Trauma	57% (n=8)
Chronic Pain (>6 months)	78.6% (n=11)
Lidocaine Patch	78.6% (n=11)
Doughnut Cushion	71% (n=10)

Results

A logistic regression model was used for the efficacy of the injections. Variable selection was done by a forward stepwise analysis with the Akaike Information Criterion (AIC). A *P* value of <0.05 was considered significant. In the final fitted model "chronic" was found to be the only important explanatory variable. Only 4 of 11 patients with chronic pain (pain greater then 6 months) showed relief, while 3 of 3 patients with acute pain improved. A standard likelihood ratio test showed that "chronic" had a significant effect (*P*<.007). Because of the small sample size, Fisher's exact test was employed as a more robust measure of significance. With this test, a *P*-value of 0.055 was obtained, demonstrating that patients with chronic pain were less likely to respond to the injections.

Because of the small sample size it was difficult to assess the efficacy of the injection within the two subgroups (chronic vs. acute) identified above. A one-sided t-test of the hypothesis that the mean of the relative improvements was less than or equal to 50% gave a *P*-value of .81 in the patients with chronic pain, and .065 in patients with acute pain. When both groups were pooled, the *P*-value is 0.64.

Discussion

Etiologies of coccydynia include trauma, childbirth, obesity, immobility, coccygeal spicules (2), as well as lumbar spinal stenosis (3). Lumbar disc herniation has also been identified as a potential etiology of coccydynia (4), however no authors have been able to attribute focal coccygeal tenderness to lumbrosacral herniations. Many cases of coccydynia have no identifiable etiology and are labeled as idiopathic. Based on our review we hypothesized that cases of coccydynia with concordant focal tenderness and no other identifiable cause are inflammatory in nature, and therefore steroid medication was chosen as the injectate.

Conservative management of coccydynia includes use of doughnut cushions, non-steroidal anti-inflammatory drug use, sitz baths, and physical therapy. Manipulation therapy for coccydynia has not been shown to be effective (5). Intrarectal manipulation through physical therapy has also not been shown to be significantly effective in the long term management of coccydynia (6). Predictors of a more positive outcome include a stable coccyx, shorter duration of symptoms, traumatic etiology, and lower score in the McGill questionnaire (6).

The efficacy of coccygectomy for coccydynia has been variable, with studies reporting anywhere from 60 to 91% success rates (7-11). Surgical outcome was shown to be increased by limiting coccygectomy to patients with instability and hypermobility of the sacrococcygeal junction (demonstrated by stress radiographs) (12). Balain et al (13) analyzed the histological correlation between efficacy of coccygectomy and presence of degenerative changes; it was found that patients with moderate to severe degenerative changes in the sacrococcygeal joint did better post operatively than those with mild or no degenerative changes.

Past studies analyzing the benefits of injection alone have been limited. Wray et al (14) examined 62 patients randomized to local injection or manipulation with injection; it was found that patients receiving injections of 40 mg methylprednisolone acetate with 10 ml of 0.25% bupivacaine faired slightly better when they received post injection coccygeal manipulation (59% vs. 85% respectively). Of note, the patients in the study received blind coccygeal soft tissue injections but not joint injections.

Our study demonstrated a significant immediate relief of pain from coccydynia after a coccygeal steroid injection (*P*=0.023), but at the 3-week follow-up only patients with acute pain (less then 6 months) had near-significant pain relief. Overall we found that 50% of patients did have significant decrease in their VAS scores, and therefore it is reasonable to attempt these injections prior to surgery in both acute and chronic cases. The steroids were placed at the sacrococcygeal junction and periarticularly — as both sacrococcygeal joint dysfunction as well as coccygeal trauma/inflammation have been identified as causes of coccdynia.

Patient selection for coccygeal injections is crucial. Patients should be ruled out for rectal and or pelvic pathology. In our group of patients there was no evidence of abdominal pain, tenesmus, constipation/diarrhea, dysmenorrhea, hemorrhoids, or melena. None of the patients had radicular signs or symptoms, root tension signs, facet tenderness, or pain exacerbated with lumbar extension and lateral rotation. Furthermore, all patients had intact skin with no evidence of pilonidal cyst. All study patients had focal tenderness over the coccyx which was concordant to their pain.

There were a number of limitations to our study, the first and most obvious being the low power. With a lower power, the study may not have produced a statistically significant result even when one existed. While acute versus chronic pain seems to be an impor-

tant explanatory variable, it is difficult to determine the importance with a small sample size. Patients with acute pain seemed to respond better then patients with chronic pain. This finding suggests that coccygeal steroid injections should be offered within the first 6 months. A larger study with longer follow up is indicated as the study limitations included small sample size as well as a relatively short follow up. The effect of multiple injections has also not been elucidated. An ideal study would compare local coccygeal injections with lower sacral nerve root (S3-5) block (e.g. caudal epidural steroid injections).

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