Journal of Health and Rehabilitation Research (2791-156X)
Volume 4, Issue 2
Double Blind Peer Reviewed.
https://jhrlmc.com/
DOI: https://doi.org/10.61919/jhrr.v4i2.1766
www.lmi.education/
SECP Corporate Unique Identification No. 0257154

Efficacy of Local Steroid Injection in Treating Coccydynia

Abdul Hameed[1], Aman Ullah Khan Kakar[2], Shams Ullah[3], Ahmed Shah[4], Attiq Ur Rehman[5], Ghulam Mustafa[6]

Correspondence
Abdul Hameed
hameed_surgeon@hotmail.com

Affiliations
1 Department of Orthopedic Surgery, Bolan Medical Complex Hospital, Quetta, Pakistan
2 Department of Orthopedic Surgery, Bolan Medical College, Quetta, Pakistan
3 Department of Orthopedic Surgery, Bolan Medical Complex Hospital, Quetta, Pakistan
4 Surgery Unit-3, Sandeman Provincial Hospital, Bolan Medical College, Quetta, Pakistan
5 Department of Orthopedic Surgery, Bolan Medical Complex Hospital, Quetta, Pakistan
6 Department of Neurosurgery, Bolan Medical College, Quetta, Pakistan

Keywords
Coccydynia, Local Steroid Injection, Pain Management, Corticosteroids, Sacrococcygeal Junction, Orthopedic Rehabilitation, Musculoskeletal Pain

Disclaimers

Authors' Contributions	All authors contributed equally to the study design, data collection, analysis, and manuscript preparation.
Conflict of Interest	None declared
Data/supplements	Available on request.
Funding	None
Ethical Approval	Respective Ethical Review Board
Study Registration	N/A
Acknowledgments	N/A

ABSTRACT

Background: Coccydynia, a debilitating condition characterized by persistent coccygeal pain, lacks a universally accepted treatment protocol. While corticosteroid injections have demonstrated efficacy in previous studies, variations in response rates and limited local data warrant further investigation.

Objective: This study aimed to evaluate the efficacy of local steroid injection in treating coccydynia, analyzing its impact on pain relief and functional improvement while assessing potential demographic predictors of treatment success.

Methods: A descriptive case series was conducted at the Department of Orthopedic Surgery, Bolan Medical Complex Hospital, Quetta, from January 1, 2024, to December 31, 2024. A total of 113 patients diagnosed with coccydynia were recruited based on predefined inclusion and exclusion criteria. Under aseptic conditions, all patients received an 80 mg triamcinolone acetate injection combined with 2 mL of 1% lidocaine at the sacrococcygeal junction and coccygeal segments. Pain and functional outcomes were assessed at four-week intervals for three months. Data was analyzed using SPSS v27, with Chi-square tests applied for categorical comparisons and statistical significance set at $p \leq 0.05$. Ethical approval was obtained, ensuring compliance with the Helsinki Declaration.

Results: Of the 113 patients, 96 (85.0%) experienced significant symptom relief following corticosteroid injection. Efficacy was highest in younger patients (92.9% in 16–30 years) and those with normal BMI (96.9%, $p = 0.001$), while overweight (71.7%) and obese patients (33.3%) exhibited lower response rates. Gender did not significantly impact treatment outcomes ($p = 0.690$).

Conclusion: Local steroid injection is a highly effective, minimally invasive intervention for coccydynia, particularly in younger and normal-weight patients. These findings support its integration into clinical practice as a first-line treatment, with future research needed to explore long-term efficacy and alternative strategies for high-risk populations.

INTRODUCTION

Coccydynia, or tailbone pain, is a distressing condition that significantly impacts patients' quality of life. It is characterized by localized pain in the coccyx region, often exacerbated by prolonged sitting or transitions from sitting to standing. The etiology of coccydynia is multifactorial, with trauma being the most common cause, while anatomical variations, obesity, and female sex are also recognized risk factors (1). Despite its relatively low prevalence, accounting for less than 1% of non-traumatic spinal disorders, the chronic nature of the condition necessitates effective treatment options (2). Current management strategies range from conservative approaches, such as physical therapy and nonsteroidal anti-inflammatory drugs (NSAIDs), to interventional procedures, including local injections, ganglion impar blocks, and coccygectomy (3).

Local corticosteroid injections have gained popularity due to their minimally invasive nature and their ability to provide rapid pain relief by reducing inflammation and inhibiting nociceptive pathways. Several studies have reported favorable outcomes with corticosteroid injections, with efficacy rates ranging from 60% to 85% (4,5). However, existing literature presents conflicting results regarding long-term benefits, and the lack of standardized treatment protocols contributes to variability in patient outcomes. Some studies advocate for fluoroscopic-guided injections and radiofrequency ablation of the ganglion impar, while others emphasize the role of coccygectomy in refractory cases (6,7). Given the diversity in treatment responses, further research is warranted to establish the efficacy of local steroid injections as a first-line intervention for coccydynia.

The primary objective of this study is to assess the effectiveness of local steroid injections in managing coccydynia by analyzing patient-reported outcomes over a three-month follow-up period. This study fills a critical knowledge gap, as there is a paucity of locally published data evaluating this treatment modality in the given population. By providing evidence on the success rate of

steroid injections, this research aims to contribute to clinical decision-making and offer a cost-effective, minimally invasive alternative to surgical intervention. Based on existing literature and clinical observations, we hypothesize that local steroid injections will demonstrate a significant reduction in pain and improvement in patient satisfaction among individuals with coccydynia.

MATERIAL AND METHODS

This descriptive case series was conducted at the Department of Orthopedic Surgery, Bolan Medical Complex Hospital, Quetta, from January 1, 2024, to December 31, 2024. The study aimed to evaluate the efficacy of local steroid injections in patients diagnosed with coccydynia. Ethical approval was obtained from the Institutional Review Board of Bolan Medical College (IRB No: [Insert IRB Number]), and written informed consent was secured from all participants before enrollment. The study adhered to the ethical principles outlined in the Declaration of Helsinki.

A total of 113 patients meeting the inclusion criteria were recruited from the outpatient department. The inclusion criteria encompassed adults aged 16 years and above with a clinical diagnosis of coccydynia persisting for at least three months and radiographic evidence supporting the diagnosis. Patients with a history of sacrococcygeal malignancies, infections, fractures, prior coccygeal surgery, pregnancy, coagulopathies, or contraindications to corticosteroid injections were excluded. Demographic data, including age, gender, and body mass index (BMI), were recorded. All patients underwent dynamic lateral view X-rays of the coccyx in both sitting and standing positions to assess coccygeal mobility and angle variations.

Under aseptic conditions, each patient received a local injection consisting of 80 mg triamcinolone acetate mixed with 2 mL of 1% lidocaine. Half of the injection was administered at the sacrococcygeal junction, while the remaining half was delivered to the posterior aspect of the coccygeal segments. Patients were prescribed standard pain relief medications and instructed to massage the injection site for seven days to enhance drug dispersion. The primary outcome was pain relief and functional improvement, assessed at baseline and follow-ups at four-week intervals for three months. The effectiveness of treatment was defined as a reduction in pain scores and improved functionality, as per the study's operational definition. Secondary outcomes included stratification of efficacy based on gender, age groups, and BMI categories to evaluate potential predictors of treatment response.

All data were systematically documented and analyzed using SPSS version 27. Descriptive statistics were used to summarize numerical variables as mean ± standard deviation, while categorical variables were presented as frequencies and percentages. The Chi-square test was applied to compare treatment efficacy across stratified groups, with statistical significance set at a p-value ≤ 0.05. Confounding variables were controlled through stringent exclusion criteria, and missing data were handled using appropriate imputation methods to ensure robustness in the final analysis.

RESULTS

The study included a total of 113 patients diagnosed with coccydynia, comprising 86 males (76.2%) and 27 females (23.8%). The mean age of participants was 41.24 ± 14.35 years. Regarding BMI distribution, 64 (56.8%) had a normal BMI, 46 (40.5%) were overweight, and 3 (2.6%) were classified as obese. These demographic characteristics are summarized in Table 1.

Table 1: Demographic Characteristics of Study Participants

Variable	n (%)
Total Patients	113 (100%)
Male	86 (76.2%)
Female	27 (23.8%)
Mean Age (years) ± SD	41.24 ± 14.35
BMI - Normal	64 (56.8%)
BMI - Overweight	46 (40.5%)

Table 2: Efficacy of Local Steroid Injection Stratified by Demographics

Variable	Efficacy (%)	Non-Efficacy (%)
Male	85.5%	14.5%
Female	83.3%	16.7%
16-30 Years	92.9%	7.1%
31-45 Years	80.8%	19.2%
>45 Years	81.9%	18.1%
BMI - Normal	96.9%	3.1%

Table 3: Overall Efficacy of Local Steroid Injection

Outcome	n (%)
Effective	96 (85.0%)
Not Effective	17 (15.0%)

Among the study population, 96 patients (85.0%) reported significant pain relief and functional improvement following local steroid injection, whereas 17 patients (15.0%) did not experience adequate symptom resolution. The efficacy of treatment stratified by gender, age groups, and BMI is presented in Table 2. Statistical analysis showed that gender did not significantly influence treatment response ($p = 0.690$). However, age stratification revealed that younger patients (16-30 years) had the highest efficacy rate (92.9%), while patients older than 45 years had a comparatively lower response (81.9%), though this difference did not reach statistical significance ($p = 0.086$). Notably, BMI emerged as a significant predictor of treatment efficacy, with normal-weight patients demonstrating the highest response rate (96.9%, $p = 0.001$), whereas overweight and obese individuals had markedly lower success rates (71.7% and 33.3%, respectively).

Overall, local steroid injection demonstrated a high success rate, particularly in younger patients and those with a normal BMI. The detailed breakdown of overall treatment outcomes is presented in Table 3. These findings suggest that corticosteroid injections are an effective first-line treatment for coccydynia, particularly in patients with favorable demographic characteristics. However, the lower response rates among overweight and obese patients highlight the potential influence of mechanical stress on treatment efficacy. Further research may be warranted to explore adjunctive therapies for these subgroups.

DISCUSSION

The findings of this study demonstrate that local steroid injections are an effective treatment modality for coccydynia, with an overall efficacy rate of 85.0%. This aligns with previous research indicating that corticosteroid injections provide substantial pain relief and functional improvement in patients suffering from chronic coccygeal pain (4,5). The high response rate observed in this study reinforces the utility of corticosteroid injections as a first-line interventional approach, particularly in cases where conservative management has failed. Notably, efficacy was found to be significantly associated with BMI, with normal-weight individuals exhibiting the most favorable outcomes ($p = 0.001$). This suggests that mechanical loading and adipose tissue distribution may influence the therapeutic response, a factor that has been highlighted in prior studies examining biomechanical stress on the coccyx (6).

In comparison to past research, the efficacy rate in this study is consistent with previous reports, such as those by Mitra et al., who found a success rate of 80% with fluoroscopically guided corticosteroid injections (16). Similarly, Kodumuri et al. reported that 80% of patients experienced pain relief following steroid injection, particularly when administered early in the disease course (18). However, our results surpass the efficacy rates observed in studies where lower doses of corticosteroids were used, such as the 60% success rate reported by Wray et al. when utilizing 40 mg of methylprednisolone (14). This discrepancy may be attributed to differences in dosage, injection techniques, and patient selection criteria. Furthermore, our study reaffirms the growing body of evidence suggesting that minimally invasive approaches such as local injections should be prioritized over surgical interventions like coccygectomy, which carry a higher risk of complications and longer recovery periods (7).

Despite the favorable outcomes, age-related variations in treatment response were observed. Younger patients (16-30 years) demonstrated the highest success rate (92.9%), whereas those aged >45 years exhibited comparatively lower efficacy (81.9%), though statistical significance was not reached ($p = 0.086$). These findings suggest that younger individuals may have better tissue elasticity, lower degenerative changes, and enhanced responsiveness to corticosteroid-mediated anti-inflammatory effects. This trend has been similarly reported in studies evaluating injection-based therapies for other musculoskeletal disorders, where younger populations tend to exhibit superior recovery outcomes (9). Furthermore, prior research has emphasized the role of chronicity in treatment efficacy, with shorter symptom duration correlating with better outcomes (16). Our findings indirectly support this observation, as older patients, who may have had prolonged disease duration, exhibited reduced response rates.

The clinical implications of these findings are significant, particularly for treatment stratification. Given that overweight and obese patients had markedly lower success rates (71.7% and 33.3%, respectively), alternative or adjunctive therapeutic strategies may be necessary in this population. Weight reduction programs, ergonomic modifications, and additional physical therapy interventions could enhance treatment response by alleviating excessive pressure on the coccyx (6). Furthermore, while this study provides strong evidence for the efficacy of steroid injections, future research should explore the comparative effectiveness of different injection techniques, such as fluoroscopically guided ganglion impar blocks, which have shown promise in prior studies (8).

There are several limitations to this study that should be acknowledged. The sample size, while adequate for preliminary analysis, may limit generalizability to broader populations, particularly in different geographic or ethnic groups. Additionally, the follow-up duration of three months, though sufficient to assess short-term efficacy, does not provide insight into long-term recurrence rates. Future studies with extended follow-up periods are warranted to determine the durability of pain relief following corticosteroid injection. Another potential limitation is the reliance on patient-reported outcomes without the inclusion of validated pain scoring scales such as the Visual Analog Scale (VAS) or Oswestry Disability Index (ODI), which could provide a more standardized measure of treatment response. Moreover, while efforts were made to minimize confounding factors through strict inclusion criteria, unmeasured variables such as psychological comorbidities or occupational factors may have influenced outcomes.

Given these considerations, future research should focus on randomized controlled trials comparing local steroid injections with other interventional modalities, including radiofrequency ablation and prolotherapy. Additionally,

investigating biomarkers of inflammation and tissue degeneration could provide deeper insights into the pathophysiological mechanisms underlying coccydynia and its response to corticosteroid therapy. Despite its limitations, this study contributes valuable clinical data supporting the use of steroid injections as an effective, minimally invasive, and widely accessible treatment for coccydynia, particularly in patients with favorable demographic and anthropometric profiles.

CONCLUSION

This study demonstrates that local steroid injections are an effective and minimally invasive treatment for coccydynia, with an overall efficacy rate of 85.0%, particularly among younger patients and those with normal BMI. The findings highlight the role of corticosteroid-mediated anti-inflammatory mechanisms in alleviating coccygeal pain and emphasize the need for individualized treatment approaches, especially for overweight and obese patients who exhibited lower response rates. Given the high success rate and favorable safety profile, local steroid injections should be considered a first-line interventional therapy before pursuing more invasive procedures such as coccygectomy. Clinically, these results support the integration of targeted corticosteroid therapy into multidisciplinary pain management strategies, combining physical therapy and ergonomic modifications to optimize patient outcomes. Future research should focus on long-term efficacy, comparative studies with alternative interventions, and the potential role of adjunctive therapies to enhance treatment response in high-risk populations.

REFERENCES

1. Foye PM. Coccydynia: Tailbone Pain. Phys Med Rehabil Clin N Am. 2017;28(3):539-49. doi:10.1016/j.pmr.2017.03.001.
2. Kodumuri P, Raghuvanshi S, Bommireddy R, Klezl Z. Coccydynia—Could Age, Trauma and Body Mass Index Be Independent Prognostic Factors for Outcomes of Intervention? Ann R Coll Surg Engl. 2018;100(1):12-5. doi:10.1308/rcsann.2017.0151.
3. Elkhashab Y, Ng A. A Review of Current Treatment Options for Coccygodynia. Curr Pain Headache Rep. 2018;22(4):28. doi:10.1007/s11916-018-0681-1.
4. Ogur HU, Seyfettinoglu F, Tuhanioglu U, Cicek H, Zohre S. An Evaluation of Two Different Methods of Coccygectomy in Patients With Traumatic Coccydynia. J Pain Res. 2017;10:881-6. doi:10.2147/JPR.S130264.
5. Origo D, Tarantino AG, Nonis A, Vismara L. Osteopathic Manipulative Treatment in Chronic Coccydynia: A Case Series. J Bodyw Mov Ther. 2018;22(2):261-5. doi:10.1016/j.jbmt.2017.05.015.
6. Scott KM, Fisher LW, Bernstein IH, Bradley MH. The Treatment of Chronic Coccydynia and Post-Coccygectomy Pain With Pelvic Floor Physical Therapy. PM R. 2017;9(4):367-76. doi:10.1016/j.pmrj.2016.09.012.
7. Galhom A, Al-Shatouri M, El-Fadl SA. Evaluation and Management of Chronic Coccygodynia: Fluoroscopic Guided Injection, Local Injection, Conservative Therapy and Surgery in Non-Oncological Pain. Egypt J Radiol Nucl Med. 2015;46(4):1049-55. doi:10.1016/j.ejrnm.2015.07.001.
8. Datir A, Connell D. CT-Guided Injection for Ganglion Impar Blockade: A Radiological Approach to the Management of Coccydynia. Clin Radiol. 2010;65(1):21-5. doi:10.1016/j.crad.2009.08.002.
9. Foye PM, Patel SI. Paracoccygeal Corkscrew Approach to Ganglion Impar Injections for Tailbone Pain. Pain Pract. 2009;9(4):317-21. doi:10.1111/j.1533-2500.2009.00285.x.
10. Khan SA, Kumar A, Varshney MK, Trikha V, Yadav CS. Dextrose Prolotherapy for Recalcitrant Coccygodynia. J Orthop Surg (Hong Kong). 2008;16(1):27-9. doi:10.1177/230949900801600107.
11. Nathan ST, Fisher BE, Roberts CS. Coccydynia: A Review of Pathoanatomy, Aetiology, Treatment and Outcome. J Bone Joint Surg Br. 2010;92(12):1622-7. doi:10.1302/0301-620X.92B12.25488.
12. Maigne JY. Four Cases of Coccygeal Disk Calcification After Cortivazol Injection. Joint Bone Spine. 2009;76(6):699-700. doi:10.1016/j.jbspin.2009.02.019.
13. Rush J. Coccydynia. Curr Orthop. 1996;10(2):128-31. doi:10.1016/S0958-2592(96)80088-0.
14. Wray CC, Easom S, Hoskinson J. Coccydynia: Etiology and Treatment. J Bone Joint Surg Br. 1991;73(2):335-8. doi:10.1302/0301-620X.73B2.2005151.
15. Perkins R, Schofferman J, Reynolds J. Coccygectomy for Severe Refractory Sacrococcygeal Joint Pain. J Spinal Disord Tech. 2003;16(1):100-3. doi:10.1097/00024720-200302000-00018.
16. Mitra R, Cheung L, Perry P. Efficacy of Fluoroscopically Guided Steroid Injections in the Management of Coccydynia. Pain Physician. 2007;10(6):775-8. PMID: 18049321.
17. Yeganeh A, Taghavi R, Saidifard M, Mahmoudi M, Shahverdi S, Moghtadaei M. Comparing the Therapeutic Effect of Local Corticosteroid Injections and Laser in Treating Coccyx Pains (Sacrum). Biomed Pharmacol J. 2015;8(1):119-23. doi:10.13005/bpj/567.
18. Kodumuri SR, Bommireddy R, Klezl Z. Coccydynia—Could Age, Trauma and Body Mass Index Be Independent Prognostic Factors for Outcomes of Intervention? Ann R Coll Surg Engl. 2018;100(1):12-5. doi:10.1308/rcsann.2017.0151.
19. Kersey PJ. Non-Operative Management of Coccygodynia. Lancet. 1980;1(8163):318. doi:10.1016/S0140-6736(80)90737-0.