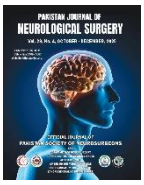

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Original Research

Effectiveness of Manipulation under Anesthesia in Patients with Chronic Coccydynia: A Case Series with Three-Month Follow-up and Rehabilitation Protocol

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ABSTRACT

Objective: To evaluate the effectiveness of MUA with steroid injection in patients with chronic coccydynia and outline a standardized rehabilitation protocol.

Methods: A descriptive case series was conducted at the Department of Neurosurgery, Punjab Institute of Neurological Sciences, Lahore. Seventy-five patients aged 25–60 years with chronic coccydynia unresponsive to conservative management underwent MUA under general anesthesia. The coccyx was manipulated with a per rectal technique, and 40 mg of methylprednisolone with 10 ml of 0.25% bupivacaine was infiltrated locally. Outcomes were assessed at 3 months using VAS and need for analgesia. Data were analyzed using SPSS v17.

Results: The mean age was 42.5 ± 11 years; 53.3% were male. The mean disease duration was 9.8 ± 3.7 months. Success was achieved in 88% of patients, with only 2.7% requiring analgesia after the procedure. No significant difference was found in outcomes based on age, gender, or disease duration.

Conclusion: MUA with local steroid infiltration is a highly effective treatment for chronic coccydynia, offering substantial relief with minimal morbidity. Incorporation of a post-MUA rehabilitation protocol enhances outcomes and reduces the need for surgical intervention.

Keywords: Coccydynia, Manipulation under anesthesia, Coccyx pain, Steroid injection, Rehabilitation.

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INTRODUCTION

Coccydynia is a painful condition affecting the coccyx, often triggered by sitting and more prevalent in women. While many patients respond to conservative treatment, a subset remains symptomatic. Manipulation under anesthesia (MUA) with local steroid infiltration has been suggested as a minimally invasive intervention for such cases. Coccydynia, characterized by pain in the coccyx area, is a rare but potentially debilitating condition that significantly impacts the quality of life of affected individuals. It accounts for approximately 1% of all backache cases and is reported to be up to five times more prevalent in females.[2,14,15,16] The pain typically worsens with sitting and may arise from trauma, childbirth, or unknown origins.[12,13] In Pakistan, recent studies have demonstrated a notable prevalence of coccydynia in postpartum women, emphasizing its clinical importance in this subgroup.[12,14]

The etiology of coccydynia is multifactorial. Imaging studies often reveal coccygeal instability, subluxation, or hypermobility.[1,2,12,16] Prognostic factors such as body mass index, trauma history, and age have also been associated with the likelihood of persistence and severity of symptoms.[13] These findings highlight the need for a comprehensive assessment to guide appropriate treatment planning.

Management strategies for coccydynia vary widely. Most patients obtain relief through conservative measures, including non-steroidal anti-inflammatory drugs (NSAIDs), ergonomic modifications, physiotherapy, and local injections.[3,4] However, refractory cases may require more invasive interventions. Coccygectomy has demonstrated favorable long-term outcomes,[15] but it is associated with complications such as wound infection and prolonged recovery. Recent reviews recommend individualized treatment approaches tailored to patient characteristics and radiological findings.[16,17]

Manipulation under anesthesia (MUA) has emerged as a minimally invasive alternative, particularly for patients unresponsive to conservative therapy but reluctant to undergo surgery. MUA, often combined with local steroid infiltration, aims to restore coccygeal alignment, alleviate muscle spasm, and reduce inflammation.[5–7] Nevertheless, standardized rehabilitation protocols following MUA are lacking, and there is limited data on outcomes from South Asian populations. Recent studies (Mulpuri et al, 2022; Sukun et al, 2024) have emphasized the value of individualized management approaches and imaging-guided assessment in coccydynia[16,17]

This study was designed to evaluate the effectiveness of MUA with steroid injection in patients with chronic coccydynia and to propose a structured rehabilitation protocol to enhance long-term outcomes.

MATERIALS & METHODS

Study Design and Setting

A prospective descriptive case series was conducted over a span of 2 years (January 2022 – December 2023) at the Department of Neurosurgery, Punjab Institute of Neurosciences (PINS), Lahore General Hospital (LGH), Lahore. The IRB reference No of this study was No. 2191/IRB/PINS/Approval/2025. Written informed consent was taken from all the patients before inclusion in this study.

Inclusion Criteria

Patients aged 25–60 years, of any gender, presenting clinical and radiological evidence of chronic coccydynia unresponsive to a minimum of two months of conservative therapy.

Exclusion Criteria

Patients unsuitable for general anesthesia, with malignancies, previous sacrococcygeal surgeries, or those lacking informed consent.

Procedure

Under general anesthesia, patients were placed in the left lateral position. The manipulation was performed using the index finger per rectally and the thumb overlying the coccyx. The coccyx was repeatedly flexed and extended for approximately one minute, followed by infiltration of 40 mg methylprednisolone and 10 ml of 0.25% bupivacaine (long-acting local anesthetic) around the coccyx.

Follow-Up

Patients were assessed three months post-procedure for pain levels using the Visual Analog Score (VAS) and their requirement for analgesics. Success was defined by a VAS score of 0–1 and no need for analgesia.

Data Analysis

Statistical analysis was executed using SPSS v17. The Chi-square test was applied for categorical comparisons, with a p-value of <0.05 deemed statistically significant.

Post-MUA Rehabilitation Protocol

A structured rehabilitation protocol was implemented to preserve therapeutic benefits:

- **Phase 1 (Days 1–3):** Rest, cold application, use of a coccyx cushion, and analgesics as needed. The wedge-shaped coccydynia cushion is preferred over the Donut cushion
- **Phase 2 (Week 1–2):** Light ambulation, pelvic floor relaxation techniques, and gentle soft tissue mobilization.
- **Phase 3 (Weeks 3–6):** Physical therapy emphasizing core/gluteal strengthening, posture correction, and neuromuscular re-education.
- **Phase 4 (Week 6 Onward):** Gradual return to sitting, resumption of functional activities, psychological support if needed.

RESULTS

A total of 75 patients participated in the study. The **mean age** was 42.48 ± 10.97 years, with participants ranging from 25 to 60 years **(Table 1).**

The **gender distribution indicated** that 53.33% were male and 46.67% were female.

The **mean disease duration** was 9.80 ± 3.69 months, with a minimum of 4 months and a maximum of 16 months **(Table 2).**

Regarding **analgesia requirements**, only 2 patients (2.7%) required analgesia post-procedure, while 73 patients (97.3%) did not **(Table 3).**

The overall **success rate** of the intervention was recorded at 88%, with 12% of patients not achieving success (Figure 1).

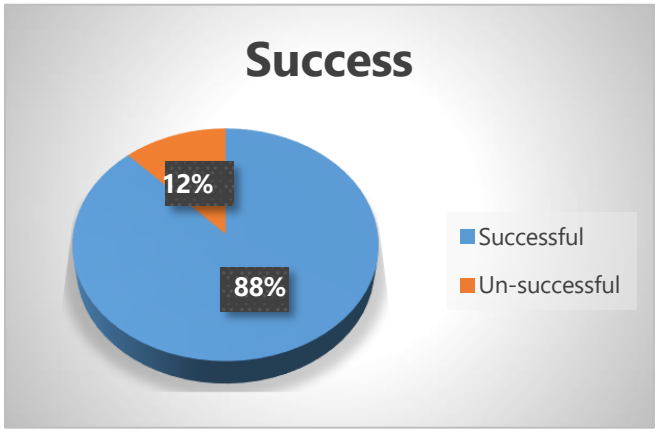

Figure 1: *Distribution of Success.*

The mean pre-procedure VAS score was 7.6 ± 1.1, which improved significantly to 1.2 ± 0.8 at three months post-procedure ($p < 0.001$). Approximately 88% of patients demonstrated more than 75% reduction in pain intensity, confirming sustained clinical improvement.

Table 1. *Descriptive statistics of age (years).*

Age (Years)	n	Mea n	SD	Minimum	Maximum
	75	42.48	10.97	25.00	60.00

Subgroup Analysis

Of the 9 patients who did not achieve success, 3 were under 40 years old, while 6 were 40 years and older. Among the 66 successful cases, 30 were under 40 and 36 were 40 or older. There was no significant statistical link between age group and treatment success (p = 0.49) **(Table 4).**

Table 2: *Descriptive statistics of duration (months) of coccydynia.*

Duration (Months)	N	Mea n	SD	Minimum	Maximum
	75	9.80	3.69	4.00	16.00

Table 3: *Distribution of need for analgesia.*

Need for Analgesia	Frequency	Percent
Yes	2	2.7%
No	73	97.3%
Total	**75**	**100%**

Table 4: *Success by age group.*

Age Group	Success: Yes	Success: No	Total
< 40 years	30 (90.9%)	3 (9.1%)	33
≥ 40 years	36 (90.0%)	6 (10.0%)	42
Total	66 (88.0%)	9 (12.0%)	75

Chi-square = 0.47, p = 0.49 (Not Significant)

Of the 9 unsuccessful cases, 6 were female and 3 were male, whereas in the 66 successful cases, 29 were female and 37 were male. No significant association was observed between gender and treatment success (p = 0.20) **(Table 5).**

Table 5: *Success by gender.*

Gender	Success: Yes	Success: No	Total
Female	29 (82.9%)	6 (17.1%)	35
Male	37 (92.5%)	3 (7.5%)	40
Total	66 (88.0%)	9 (12.0%)	75

Chi-square = 1.64, p = 0.20 (Not Significant)

Regarding disease duration, the 9 patients without success had durations of illness where 4 experienced less than 8 months, and 5 had 8 months or more. In contrast, among the 66 successful cases, 31 had a duration of less than 8 months, and 35 had 8 months or more. Once again, the association between duration and treatment success was not statistically significant (p = 1.00) **(Table 6).**

Table 6: *Success by duration of disease.*

Duration of Disease	Success: Yes	Success: No	Total
< 8 months	31 (88.6%)	4 (11.4%)	35
≥ 8 months	35 (87.5%)	5 (12.5%)	40
Total	66 (88.0%)	9 (12.0%)	75

Chi-square = 0.02, p = 1.00 (Not Significant)

DISCUSSION

This study shows that manipulation under anesthesia (MUA) with local steroid infiltration is a safe and effective treatment for chronic coccydynia. The reported 88% success rate is consistent with earlier studies by Maigne et al and Khatri et al, which documented efficacy rates between 75% and 89%.[5,6,8] These findings bolster previous research demonstrating the benefits of combining manipulation with steroid infiltration. Seker et al, noted a 61.9% rate of complete pain relief using a similar approach, with no long-term relapses, unlike the 56.5% relapse rate observed with steroid injections alone.[11]

The rationale for MUA encompasses correcting coccygeal misalignment, promoting muscle relaxation, and reducing local inflammation. Steroid infiltration enhances these effects by delivering localized anti-inflammatory benefits. Its minimally invasive nature and suitability for outpatient settings make MUA a compelling option before resorting to coccygectomy.[9,10]

Importantly, prognostic factors such as age,

trauma, and body mass index have been shown to influence outcomes in coccydynia.[14] However, in our cohort, these variables were not statistically significant, which may be due to the relatively small sample size.

Population-based data from Pakistan further highlight the burden of coccydynia, especially among postpartum women. Chatta et al,[13] and Arif et al,[14] reported a notable prevalence in this subgroup, underscoring the need for accessible and effective treatment strategies. Our findings suggest that MUA with steroid infiltration may be a suitable therapeutic option in such patients, offering pain relief without subjecting them to higher-risk surgical procedures.

While coccygectomy remains an established option with good long-term outcomes,[16] it carries risks of infection, wound complications, and persistent pain even after surgical intervention. Therefore, MUA with steroid infiltration offers a safer alternative, particularly in patients who are reluctant or unsuitable for surgery. Recent imaging-based studies also emphasize the importance of radiological evaluation in guiding treatment decisions,[17] which could further refine patient selection for this intervention. Our findings endorse MUA as a viable intermediate treatment, particularly in resource-constrained settings.

Finally, Garg and Ahuja's comprehensive review on coccydynia emphasized the need for individualized management strategies.[12] In line with this, our incorporation of a structured rehabilitation protocol contributes to optimizing outcomes and reducing the recurrence of symptoms after MUA.

CONCLUSION

Manipulation under anesthesia combined with local steroid infiltration significantly alleviates symptoms in patients with chronic coccydynia unresponsive to conservative treatments. Our findings are consistent with both local reports of high prevalence, particularly in postpartum women[13,15] and international evidence supporting minimally invasive interventions.[14,16,17] Compared with coccygectomy, which remains an effective but higher-risk option,[16] MUA offers a safer intermediate step with fewer complications and faster recovery.

The incorporation of a structured rehabilitation protocol further enhances outcomes, aligns with recommendations for individualized management,[12] and may help reduce recurrence. Radiological assessment, as emphasized in recent studies,[17] could refine patient selection and improve long-term results.

Overall, MUA with steroid infiltration should be considered a valuable treatment option in resource-constrained settings and in patients who are unwilling or unsuitable for surgery.

RECOMMENDATIONS

Based on our findings, we recommend that MUA with local steroid infiltration should be considered as an intermediate treatment option in patients with chronic coccydynia who fail to respond to conservative therapy.

In populations at high risk, such as postpartum women, early referral and intervention may prevent chronicity and improve quality of life.

Furthermore, the inclusion of a structured rehabilitation protocol should be encouraged to consolidate pain relief and restore function. Future multicenter studies with larger cohorts and long-term follow-up are recommended to validate these results and identify prognostic factors that may predict treatment success.

LIMITATIONS

This study lacked a control group for comparison, and the follow-up period was limited to three months. Future studies with longer follow-up and control cohorts are warranted to validate the long-term efficacy of MUA.

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Additional Information

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AUTHORS CONTRIBUTIONS

Sr.#	Author's Full Name	Intellectual Contribution to Paper in Terms of:
1.	Syed Ahmad Faizan Bukhari	1. Study Conception and Data Collection.
2.	Syed Ahmad Bilal Bukhari	2. Data Collection and Manuscript Writing.
3.	Zubair Mustafa Khan	3. Literature Review.
4.	Muhammad Waqas	4. Literature Review.
5.	Mah-e-Noor Zahra	5. Data Analysis and Result Compilation.