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ORIGINAL RESEARCH

Evaluating various aetiologies of chronic orchialgia and the response to multimodal therapy in central India: a prospective observational study

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Background: Chronic orchialgia, defined as scrotal or testicular pain persisting for more than three months, significantly affects quality of life and presents diagnostic and therapeutic challenges. This study aims to evaluate the various aetiological factors of chronic orchialgia and assess the outcomes of multimodal management strategies in a tertiary care setting.

Methods: This prospective observational study was conducted at the All India Institute of Medical Sciences (AIIMS) in Bhopal from March 2023 to September 2024. A total of 181 male patients aged 18–80 years with chronic orchialgia were enrolled. The comprehensive evaluation included a history, clinical examination, laboratory workup, imaging, and psychiatric assessment. Multimodal management involved pharmacological therapy (nonsteroidal anti-inflammatory drugs [NSAIDs], amitriptyline, pregabalin), physical therapy, surgical interventions, pain clinic referrals, and psychological counselling. Follow-up was performed at 15 days, six weeks, and three months using the Visual Analogue Scale (VAS) to assess pain.

Results: Among 181 patients, the mean age was 37.5 years. Common aetiologies included varicocele (28%), epididymal cysts (14%), hydrocele (11%), hernia (10%), infections (9%), neuropathic pain (8%), and idiopathic cases (20%). Conservative management resulted in a significant improvement in VAS scores, with a mean reduction from 3.64 ± 1.66 to 1.17 ± 1.09 ($p < 0.001$). Surgery was performed in 15 patients with structural causes, resulting in further improvement, with a mean VAS score of 1.6. Factors such as younger age, shorter symptom duration, and identifiable aetiology predicted better outcomes.

Conclusion: Chronic orchialgia requires a multimodal, individualised approach that integrates pharmacological, surgical, psychological, and physiotherapeutic interventions. Early diagnosis and targeted therapy significantly improve patient outcomes and quality of life.

Keywords: chronic orchialgia, varicocele, epididymal cyst, testicular pain, multimodal therapy

Introduction

Chronic orchialgia, characterised by intermittent or continuous scrotal pain lasting for over three months, is a common but poorly understood clinical entity affecting up to 4.8% of urology consultations worldwide.[1-4] Its aetiology is multifactorial, encompassing infections, varicocele, prior surgeries, neuropathic pain, pelvic floor dysfunction, and idiopathic when no cause can be attributed to chronic testicular pain (chronic orchialgia).[5-9]

The absence of standardised guidelines complicates evaluation and management, often leading to recurrent healthcare visits, psychological distress, and diminished quality of life.[10,11] Recent literature underscores the importance of multimodal therapy that incorporates pharmacological, surgical, and psychological interventions to address the complex pathophysiology of chronic orchialgia.[12] This study aims to elucidate regional aetiological patterns and assess multimodal management outcomes in central India.

Materials and methods

Study design and setting

This prospective, observational study was conducted at the Department of Urology, All India Institute of Medical Sciences (AIIMS) in Bhopal, between March 2023 and September 2024. Ethical approval was obtained (reference AIIMS/BPL/IHECSR/JULY/22/SS/08).

Study population

A total of 181 consecutive male patients aged 18–80 years presenting with chronic orchialgia (> 3 months duration) were included. Exclusion criteria were acute orchialgia, testicular trauma, abscess, acute prostatitis, and testicular tumours.

Baseline assessment

A comprehensive history included demographic data, occupational details, lifestyle factors, sexual history, prior surgeries, and psychiatric comorbidities. The physical examination evaluated scrotal contents for varicocele, hydrocele, epididymal cysts, and hernia.

Specific investigations included:

- scrotum ultrasound,
- urinalysis and urine acid-fast bacilli,
- serum prostate-specific antigen, complete blood count, C-reactive protein, and
- sexually transmitted infection screening when indicated.

Treatment protocol

Multimodal therapy (Figure 1) was individualised based on aetiology:

- Nonsteroidal anti-inflammatory drugs (NSAIDs) (diclofenac 50 mg BD [twice a day]) for two weeks.
- Amitriptyline 25–75 mg HS (at bedtime) or pregabalin 75–150 mg HS for three months.

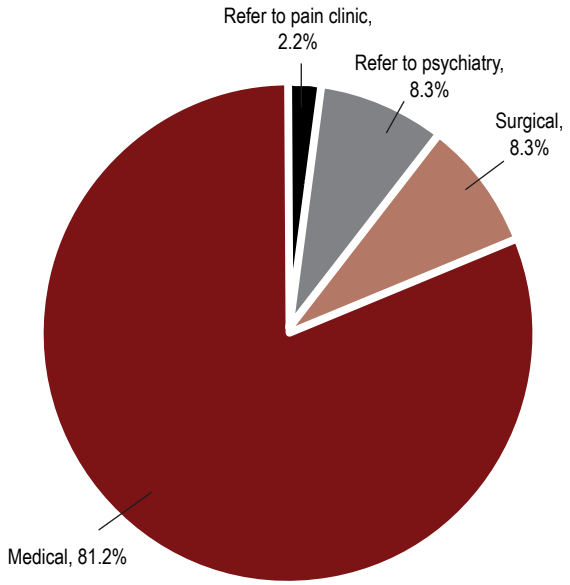

Figure 1: Treatment modality in study subjects (n = 181)

- Antibiotics for infections.
- Alpha-blockers for pelvic floor dysfunction/chronic pelvic pain syndrome/benign prostatic hyperplasia.
- Physiotherapy for pelvic floor rehabilitation.
- Surgical correction (hernioplasty, sac eversion for hydrocele, varicocelectomy, circumcision, sebaceous cyst excision).
- Pain clinic referrals for refractory cases.
- Psychological counselling for idiopathic or refractory pain.

Follow-up and outcome assessment

Follow-up was performed at 15 days, six weeks, and three months. Pain was assessed using the Visual Analogue Scale (VAS).[13] Treatment success was defined as a ≥ 50% reduction in the VAS score.

Statistical analysis

The Statistical Package for the Social Sciences (SPSS) version 25 was used. Continuous variables were compared using a paired t-test, and categorical variables were compared using the chi-square test. Binary logistic regression was used to analyse predictors of treatment response. A p-value < 0.05 was significant.

Results

Demographics and baseline characteristics

The mean age was 37.5 years. The distribution across the age groups showed that 61% of patients were aged ≤ 40 years.

Aetiological spectrum

- The aetiological distribution of the study population is presented in Table I.

Symptoms

The most common presenting symptoms were dull aching pain (71%), heaviness (46%), radiation to the groin (29%), and intermittent exacerbations (33%). The duration of symptoms varied between six months (41%) and more than six months (59%).

Table I: Aetiological distribution (n = 181)

Aetiology	%
Varicocele	28
Epididymal cyst	14
Hydrocele	11
Inguinal hernia	10
Infection	9
Neuropathic pain	8
Prior surgeries	5
Idiopathic	20

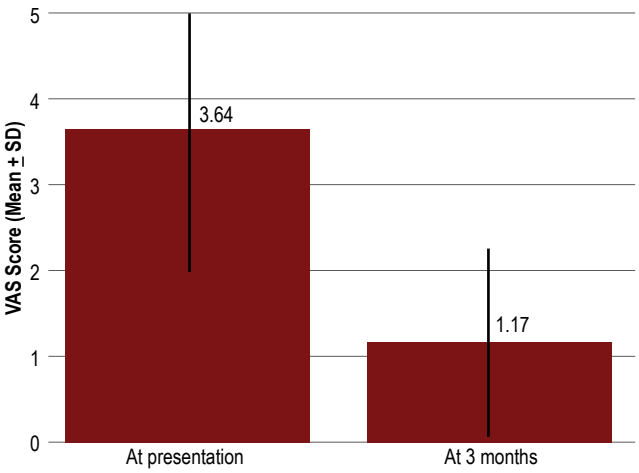

Figure 2: Bar chart of the mean VAS score at presentation and three months
SD – standard deviation, VAS – Visual Analogue Scale

Table II: Predictors of successful treatment outcome

Predictor	p-value
Age ≤ 40 years	0.02
Symptom duration < 6 months	0.03
Identifiable aetiology	< 0.001

Treatment outcomes

At baseline, the VAS score was 3.64 ± 1.66, indicating a moderate level of pain among the subjects. After three months, the mean VAS score significantly decreased to 1.17 ± 1.09 (p < 0.001) (Figure 2).

Surgical interventions

The surgical interventions (15 cases) included hernioplasty (six cases), hydrocelectomy (three cases), varicocelectomy (five cases), and circumcision (one case). The post-surgery VAS score further reduced to a mean of 1.6.

Predictors of a successful outcome

Predictors of a successful outcome were an age ≤ 40 years (p = 0.02), a symptom duration of less than six months (p = 0.03), and an identifiable aetiology (p < 0.001) (Table II).

Table III: Association of VAS scores with BMI categories

VAS score	Normal weight (*n* = 104)	Overweight (*n* = 36)	Obese (*n* = 41)	*p*-value
At presentation	3.39 ± 1.54	3.81 ± 1.85	4.10 ± 1.71	0.056
At 3 months	0.98 ± 0.99	1.25 ± 1.13	1.63 ± 0.94	0.002

BMI – body mass index, VAS – Visual Analogue Scale

Association of VAS scores with body mass index categories

At presentation, the mean VAS score was 3.39 ± 1.54 for individuals with a body mass index (BMI) ≤ 22.9 kg/m², and 3.96 ± 1.77 for those with a BMI ≥ 22.9 kg/m², with a near significant difference (p = 0.056) (Table III). At three months, the mean VAS score was 0.98 ± 0.99 for the lower BMI group and 1.45 ± 1.05 for the higher BMI group, showing a statistically significant difference (p = 0.002). This suggests that a higher BMI is associated with a higher VAS score, especially at follow-up.

Binary logistic regression

A younger age (odds ratio [OR] 1.65), a shorter symptom duration (OR 2.13), and an identifiable aetiology (OR 2.86) were significant predictors of treatment success.

Complications

No major complications were noted. Minor side effects included dizziness (2%), somnolence (3%), and gastrointestinal intolerance (4%).

Discussion

The study's findings reaffirm the complex and multifactorial nature of chronic orchialgia.[1,5,10] Varicocele, hydrocele, and epididymal cysts were the leading structural causes, similar to earlier reports.[9] Importantly, approximately one-fifth remained idiopathic, in line with global data.[2,6]

In our study, most patients (81.2%) received medical treatment, while only 8.3% underwent surgical intervention. This reflects the prevailing consensus that conservative therapy should be the primary approach for managing persistent orchialgia, consistent with the recommendations of Levine.[5] NSAIDs were commonly used, along with tricyclic antidepressants (such as amitriptyline) or anticonvulsants (such as pregabalin), which are effective in treating neuropathic pain. Scrotal support was also provided to reduce discomfort. Additionally, antibiotics were administered when there was suspicion of an infection, which is standard practice in treating suspected bacterial aetiologies. This approach underscores the importance of starting with less invasive treatments and reserving surgery for cases where conservative methods fail to provide relief.

Neuropathic elements were significant contributors, underscoring the need for neuropathic pain modulators.[11,13] Amitriptyline and pregabalin offered considerable pain reduction, consistent with the literature.[14,15] Pelvic floor dysfunction, an underdiagnosed entity, responded well to physiotherapy, echoing prior studies by Farrell et al.[16]

Surgical correction offered excellent results in carefully selected patients. In our study, 15/181 patients underwent surgical procedures. Surgery was reserved for patients with an inguinal hernia, hydrocele, or varicocele with refractory pain unresponsive to conservative treatment. The most common surgical procedures were hernia sac eversion (40%) in patients with hydrocele, and hernioplasty (20%) in patients with inguinal hernia. Moreover, laparoscopic varicocelectomy was performed in two patients (13.3%) for whom conservative treatment did not provide pain relief. These operations provided effective pain relief in several cases.

Levine point out that surgical interventions should be used with caution, as they can have unpredictable consequences and should only be considered as a last resort after less invasive options have been exhausted.[5] Microsurgical denervation was not performed due to the limited study period.[17] However, future studies should incorporate microsurgical spermatic cord denervation (MSCD) as a valuable option.

Varicocele was the most common cause of chronic orchialgia in our study. However, 24.3% of our patients presented with idiopathic orchialgia, consistent with previous studies that showed no identifiable aetiology in 25–50% of cases.[1] The idiopathic nature of chronic orchialgia complicates both diagnosis and treatment.

Our study reinforces the need for individualised, multimodal treatment strategies utilising medical management. If the pain was unrelieved after three months, patients were referred to a psychiatric outpatient department and pain clinic to address the diverse causes of chronic orchialgia and scrotal pain, also suggested by Lian et al.[18]

The psychological impact of persistent orchialgia is significant. In our study, 8.3% of patients were referred for psychiatric treatment, highlighting the significant psychological burden associated with persistent testicular pain. Chronic pain is often associated with anxiety, sadness, and reduced quality of life, as shown by Lian et al.[18] Additionally, they emphasised the need to consider psychosocial aspects in the treatment of persistent pelvic pain, including orchialgia, as psychological distress can increase the perception of pain.[18] Multimodal, individualised management produced excellent outcomes, with > 70% overall satisfactory results, consistent with prior multidisciplinary studies.[19]

Study limitations

Limitations include the single-centre design, short follow-up period, and the absence of MSCD as a treatment modality.

Conclusion

Chronic orchialgia remains a diagnostic and therapeutic challenge that requires comprehensive evaluation and multimodal, individualised management. The early recognition of aetiological

factors and the incorporation of pharmacological, surgical, psychological, and rehabilitative therapies significantly improve outcomes.

Conflict of interest

The authors declare no conflict of interest.

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Ethical approval

Ethical approval was obtained from AIIMS Institutional Human Ethics Committee (reference AIIMS/BPL/IHECSR/JULY/22/SS/08).

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