



Case Report

Pain management for interstitial cystitis and its response to superior hypogastric nerve block and pudendal nerve block

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Abstract

Background: Interstitial cystitis (IC) presents significant therapeutic challenges due to its complex pathophysiology and variable response to conventional treatments. This case report describes the successful management of refractory IC using a combination of superior hypogastric nerve block and ultrasound-guided pudendal nerve block.

Case Presentation: A 70-year-old woman presented with a one-year history of severe right sided perineal pain (NRS 8/10), frequent urination, and nocturia. Initial conservative management with oral medications showed limited efficacy. The patient underwent a fluoroscopy-guided superior hypogastric nerve block, resulting in 20-30% pain reduction and modest improvement in urinary symptoms. Subsequently, an ultrasound-guided pudendal nerve block was performed, leading to 80% pain reduction, significant improvement in urinary symptoms, and enhanced quality of life, as evidenced by improvement in the King's Health Questionnaire score from 76 to 39.

Discussion: The marked improvement following the combined nerve block approach suggests that targeted intervention of both the superior hypogastric plexus and pudendal nerve may provide effective pain relief in refractory IC. The use of ultrasound guidance enabled precise anatomical targeting and real-time visualization of local anaesthetic spread.

Conclusion: Combined superior hypogastric and pudendal nerve blocks may offer an effective, minimally invasive option for managing refractory IC, particularly before considering more invasive surgical interventions.

Keywords: Interstitial cystitis, Pudendal nerve block, Superior hypogastric plexus block, Chronic pelvic pain, Ultrasound-guided nerve block, Pain management.

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1. Introduction

Interstitial cystitis (IC) represents a complex chronic pain condition characterized by persistent pelvic, perineal, or bladder pain accompanied by lower urinary tract symptoms.¹ The condition's etiology remains poorly understood, presenting significant challenges in developing effective treatment strategies. Current therapeutic approaches encompass a spectrum of interventions, ranging from conservative management to invasive procedures.²

The pudendal nerve comprising 80% sensory and 20% motor fibers originating from the ventral rami of S2, S3& S4,

plays a crucial role in pelvic pain perception. Pudendal neuralgia significantly impacts daily activities, including sitting, standing, and sexual function.³ Various techniques have emerged for managing pudendal neuralgia, including nerve stimulator-guided approaches, conventional C-arm fluoroscopy guidance, CT guidance, and ultrasound guidance with or without pulsed radiofrequency.⁴

Treatment guidelines for IC suggest a step-wise approach, beginning with behavioural modifications and progressing through oral medications, bladder instillations,

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and surgical interventions.⁵ However, first-line treatments often show limited efficacy, while second-line oral therapies may offer only modest relief while carrying potential side effects.⁶ The superior hypogastric plexus, which mediates visceral pelvic pain, has emerged as a target for intervention in refractory cases.⁷

Ultrasound-guided procedures offer several advantages in managing chronic pelvic pain, including real-time visualization of anatomical structures, absence of radiation exposure, and direct observation of local anesthetic spread.⁸ However, the management of chronic pelvic pain remains challenging, often requiring a multimodal approach that integrates pharmacological, interventional, and psychological strategies.⁹

This case report presents a patient with refractory IC who underwent a combination of superior hypogastric nerve block and ultrasound-guided pudendal nerve block documenting the therapeutic response and functional outcomes. The findings contribute to the growing body of evidence supporting interventional approaches in managing complex pelvic pain syndromes.

2. Case Presentation

A 68 year-old woman presented with a one-year history of persistent right perineal pain. The pain was characterized as pricking and continuous in nature, with notable exacerbation during and after urination, as well as while eating. The patient rated her pain intensity as 8/10 on the Numeric Rating Scale (NRS). Additionally, she reported significant urinary symptoms, including urgency every 15 minutes and nocturia requiring 8-10 bathroom visits per night, which severely disrupted her sleep patterns. The pain persisted during rest and daily activities. Initial urology evaluation included cystoscopy, which revealed oedema of the external urinary meatus suggestive of interstitial cystitis. Subsequent biopsy demonstrated abnormal tissue growth showing metaplastic squamous papilloma with dysplasia and urinalysis revealed Paris system- category III- atypical Urothelial cells. The patient's baseline quality of life assessment using the King's Health Questionnaire yielded a score of 76/111, indicating significant impairment of daily functioning.

Treatment was initiated with oral medications, including Cystopen 100mg twice daily and Pregabid [Pregabalin] CR 82.5mg at bedtime. As there was no improvement even after oral therapy the treatment regimen was augmented with Duzela 20mg at bedtime. Due to inadequate response to conservative management, the patient underwent a diagnostic right-sided superior hypogastric nerve block. Superior hypogastric plexus block was given in prone position under C-arm guidance on the right side of anterior border of L4-L5 vertebrae junction, 6ml of 0.25% Bupivacaine and 40mg Kenacort (triamcinolone) was injected. Position was confirmed with injection prior to the injection of Bupivacaine after confirming spread under C-arm. (Figure 1, Figure 2)

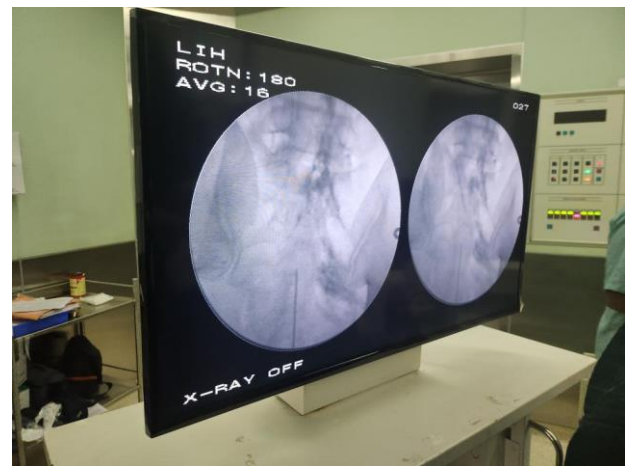


Figure 1: Showing C-Arm guided Superior hypogastric plexus block

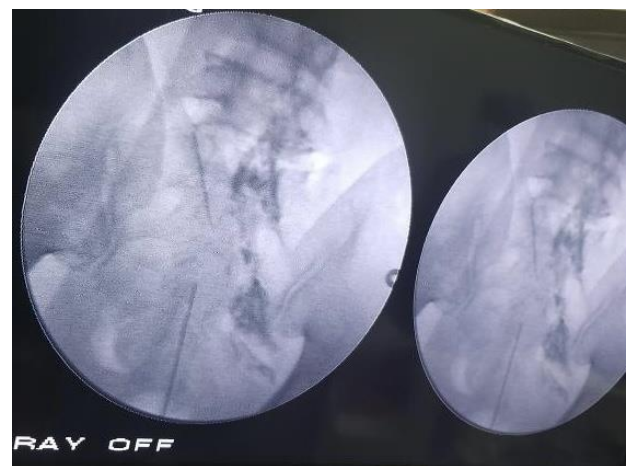


Figure 2: Showing C-Arm guided superior hypogastric plexus block

Post-procedure assessment revealed a 20% improvement in pain relief, with nocturnal urinary frequency decreasing to 5-6 times per night. The patient reported complete pain relief at rest, though discomfort persisted in the right perineal region during sitting and post-micturition, with pain scores reducing to 5-6/10 on the NRS.

By the fourth post-procedure day, the patient demonstrated a 30% overall reduction in pain, with urinary frequency further decreasing to 4-5 times per night. However, persistent post-prandial and post-micturition pain, along with continued sleep disturbance, prompted the decision to proceed with an ultrasound-guided right pudendal nerve block. Pudendal nerve was identified using ultrasound guidance frequency kept at 10MHz and depth kept at 5cm by transgluteal (Figure 3) approach near the ischial spine and peripheral nerve stimulator current started at 0.30 mA and increased subsequently for precise localisation, and then drug was administered 0.25% Bupivacaine 4cc and Kenacort (triamcinolone) 40mg after confirming its spread on the ultrasound machine. (Figure 4, Figure 5)



Figure 3: Showing patient in prone position for transgluteal approach for pudendal nerve block



Figure 4: Showing USG landmarks for pudendal nerve block

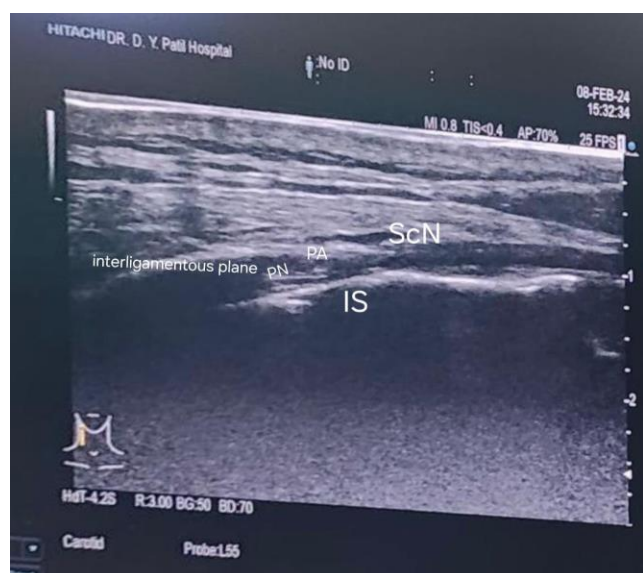


Figure 5: Showing USG landmarks for pudendal nerve block

Following the pudendal nerve block, the patient reported remarkable improvement, with an 80% reduction in pain intensity. Urinary frequency normalized significantly, and sleep disturbances resolved. The post-intervention King's Health Questionnaire score improved to 39/111, and pain score reducing to 2/10 on NRS reflecting substantial enhancement in quality of life. The patient was discharged on oral analgesics with a scheduled 30-day follow-up appointment.

3. Discussion

The successful management of our patient with refractory IC through a combination of superior hypogastric nerve block and ultrasound-guided pudendal nerve block demonstrates the potential efficacy of minimally invasive interventional approaches in managing chronic pelvic pain syndromes. The significant improvement in both pain scores and quality of life metrics aligns with emerging evidence supporting multimodal intervention strategies.

Our patient's presentation with chronic perineal pain and urinary symptoms is consistent with the classical manifestation of IC, which often presents diagnostic and therapeutic challenges. The initial approach using oral medications, including gabapentinoids and anticholinergics, follows current treatment guidelines, though the modest response observed mirrors findings from previous studies. Sant et al. reported similar limitations with oral therapy, noting that while medications may provide initial relief, their long-term efficacy can be limited.⁶

The decision to proceed with superior hypogastric nerve block as an intermediate intervention aligns with recent literature supporting its role in visceral pelvic pain management. Bosscher demonstrated that superior hypogastric plexus blockade can effectively reduce pelvic pain intensity and improve functional status.⁷ In our case, 20–30% improvement following the superior hypogastric block, suggested the need for additional intervention, supporting the concept of a graduated therapeutic approach.

The marked improvement (80%) following ultrasound-guided pudendal nerve block in our patient corresponds with emerging evidence favouring ultrasound guidance for such procedures. This technique offers several advantages over traditional approaches, including real-time visualization of anatomical structures and the ability to observe local anesthetic spread.⁸ The absence of radiation exposure makes it particularly suitable for procedures that may require repetition. Our findings support previous studies suggesting that precise anatomical targeting under ultrasound guidance may enhance therapeutic outcomes.

The comprehensive improvement in our patient's symptoms, including both pain and urinary symptoms, highlights the interconnected nature of pelvic pain pathways. This observation aligns with current understanding of the

complex neuroanatomy involved in IC, as described by Hanno et al.¹² The reduction in urinary frequency and nocturia following intervention suggests that successful management of neuropathic pain components may positively influence bladder function.

The significant improvement in quality of life score (from 76 to 39 on the King's Health Questionnaire) underscores the profound impact that effective pain management can have on patient functionality. This outcome supports the findings of El-Hefnawy et al., who demonstrated that targeted intervention for IC can lead to substantial improvements in quality of life metrics.¹⁵

Recent meta-analyses suggest that while various treatment modalities exist for IC, including oral medications, intravesical therapies, and surgical interventions, no single approach has emerged as universally effective.⁵ Our case supports a staged, multimodal approach, with interventional procedures playing a crucial role in refractory cases. The combination of superior hypogastric and pudendal nerve blocks may offer a less invasive alternative to surgical intervention in selected patients. Post operatively patient was continued on same drugs Tab Pregabalin as these drugs can't be stopped abruptly and Tab Diclofenac as it is NSAID for minimal pain relief caused due to injection.

The successful outcome in our case also highlights the importance of precise diagnostic evaluation and targeted intervention. The use of both fluoroscopic and ultrasound guidance for nerve blocks represents an evolution in technical approach, potentially offering more precise therapeutic targeting. This aligns with current trends in interventional pain management, where image guidance is increasingly recognized as crucial for optimal outcomes.¹⁴

4. Conclusion

This case report demonstrates the effectiveness of a combined interventional approach using superior hypogastric nerve block and ultrasound-guided pudendal nerve block in managing refractory interstitial cystitis.

5. Limitations

While our results are encouraging, it is important to acknowledge that individual responses to intervention may vary. Long-term follow-up will be essential to determine the durability of response and potential need for repeated interventions and proper treatment taken by patient with regular follow up.

6. Follow Up

In our follow up with the patient after 1 year. Patient have return of pain and symptoms but her NRS is 5/10 with 50% pain relief. She doesn't have urgency but have nocturia 2-3 times per night. She doesn't have difficulty in doing her daily activities.

Ultrasound guided Pudendal nerve root block was repeated and there was significant relief of pain with NRS 2/10.

7. Declaration of Patient Consent

Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

8. Source of Funding

None.

9. Conflict of Interest

None.

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