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Original Research Article

DELAYED SECONDARY REPAIR FOR OBSTETRIC ANAL SPHINCTER INJURIES (OASIS): SINGLE CENTRE EXPERIENCE

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ABSTRACT

Background: Obstetric anal sphincter injuries (OASIS) are a significant complication of childbirth, often resulting in fecal incontinence and reduced quality of life. This study evaluates outcomes of delayed secondary repair of OASIS with various sphincteroplasty techniques at a single center. The case series demonstrates significant symptomatic improvement and high patient satisfaction, supporting the use of delayed repair in missed or inadequately treated injuries. This case series aimed to evaluate the clinical outcomes of sphincteroplasty by various techniques in patients presenting with delayed or missed OASIS.

Materials and Methods: The study included 8 female patients treated at a single institution over 3 years. All participants had a history of instrumental delivery and episiotomy, with symptoms of incontinence. Preoperative and postoperative assessments were performed using the Wexner scoring system. Overlapping sphincteroplasty with Martius flap was performed in 4 cases, Direct apposition sphincteroplasty was performed in 2 cases and Overlapping sphincteroplasty was performed in 2 cases. Follow-up was conducted at 3 months, 6 months, 1 year, and 2 years to evaluate symptomatic improvement and patient satisfaction.

Results: The mean age of the participants was 32 years (range: 22–45 years). All patients experienced symptomatic improvement following surgery, with significant reductions in the Wexner scores and high patient satisfaction rates. One patient had superficial infection settled by antibiotics and conservative management. No incontinence symptoms were reported at regular follow-up.

Conclusion: Delayed sphincteroplasty is an effective surgical approach for treating missed or inadequately repaired OASIS, offering satisfactory outcomes. However, prevention through improved obstetric practices remains an optimal strategy.

Keywords: Incontinence, OASIS, Wexner score, Sphincteroplasty.

INTRODUCTION

Obstetric anal sphincter injuries (OASIS) represent one of the most significant complications of vaginal delivery, with profound implications for maternal quality of life and long-term functional outcomes. These injuries, encompassing third and fourth-degree perineal tears, occur in approximately 0.6% to 9% of vaginal deliveries in developed countries, with substantial variation based on population characteristics, obstetric practices, and diagnostic protocols.[1,2] The sequelae of OASIS can be devastating, including fecal incontinence, sexual dysfunction, perineal pain, and significant psychological distress, all of which can persist for years following delivery and dramatically impact a woman's physical, emotional, and social well-being.[3,4]

The management paradigm for OASIS traditionally emphasizes immediate primary repair performed at the time of delivery, ideally by experienced practitioners using recognized surgical techniques.

When executed properly, primary repair achieves satisfactory outcomes in a substantial proportion of women, with reported continence rates ranging from 60% to 80% in the immediate postpartum period.[5] However, despite optimal primary repair, a significant subset of women—estimated at 15% to 40%—continue to experience persistent or progressive symptoms of anal incontinence, which may manifest immediately or develop over subsequent months to years.[6,7] These persistent symptoms can result from multiple factors, including inadequate initial repair, wound infection, dehiscence, unrecognized injury, progressive denervation, or sphincter atrophy.

For women who experience failed primary repair or develop delayed symptoms, secondary repair of the anal sphincter represents an important therapeutic option. Delayed secondary repair, typically performed at least three to six months after the initial injury to allow complete tissue healing and resolution of inflammation, involves re-approximation of the disrupted sphincter complex through various surgical techniques including overlapping sphincteroplasty, end-to-end repair, or sphincter augmentation procedures. The rationale for delayed repair centers on optimizing tissue quality, allowing accurate assessment of sphincter anatomy, and ensuring that conservative management options have been adequately explored.

The existing literature on delayed secondary repair for OASIS reveals considerable heterogeneity in patient selection criteria, surgical techniques, outcome measures, and success rates. Published success rates for secondary sphincteroplasty vary widely, ranging from 40% to 90%, with most studies reporting good to excellent short-term outcomes in approximately 70% of patients.[8,9] However, long-term follow-up studies have demonstrated deterioration in functional outcomes over time, with continence deteriorating in up to 50% of initially successful repairs at five to ten years post-procedure.10 This temporal decline in efficacy, combined with the technical challenges of operating in previously scarred tissue, underscores the importance of careful patient selection, meticulous surgical technique, and realistic counseling regarding expected outcomes.

Despite the clinical significance of this condition and the potential for surgical intervention to restore quality of life, there remains a paucity of large, well-designed studies examining the outcomes of delayed secondary repair in contemporary obstetric populations. Many existing studies are limited by small sample sizes, retrospective designs, short follow-up periods, lack of validated outcome measures, and absence of standardized surgical protocols. Furthermore, the identification of prognostic factors that predict successful outcomes remains incompletely defined, making evidence-based patient counseling challenging.

This single-centre retrospective study aims to comprehensively evaluate our institutional experience with delayed secondary repair for OASIS, analyzing patient characteristics, surgical techniques employed, functional outcomes using validated scoring systems, complication rates, and factors associated with surgical success or failure. By contributing to the existing body of evidence, we hope to enhance understanding of the role of delayed secondary repair in the management algorithm for OASIS and provide clinicians with practical insights to optimize patient selection and surgical outcomes.

MATERIALS AND METHODS

Eight female patients presenting with complaints of fecal incontinence post-instrumental delivery or episiotomy underwent delayed secondary repair at Tirunelveli Medical College. Wexner continence scoring was used pre- and postoperatively to evaluate outcomes. Surgical methods included direct apposition sphincteroplasty, overlapping sphincteroplasty with and without Martius flap. Overlapping sphincteroplasty with Martius flap was performed in 4 cases, Direct apposition sphincteroplasty was performed in 2 cases and Overlapping sphincteroplasty was performed in 2 cases. Follow-up was conducted at serial intervals to evaluate symptomatic improvement and patient satisfaction.

Operative procedure: The procedure was performed under spinal or general anesthesia with the patient in a lithotomy position, and the pelvis was elevated using a small pad.

Overlapping Sphincteroplasty- A transverse incision was made between the anus and vagina, with small slanting extensions upwards and downward on both sides to ease dissection and widen the operative field, aiding hemostasis and facilitating wound closure. Low-energy diathermy was used for dissection until the divided edges of the sphincter muscle were clearly defined and free to the lateral ischio-anal space, providing suffi- cient muscle length for tension-free overlapping. Careful dissection is crucial to avoid bleeding from the vaginal vessels or accidental perforation of the vagina or anal canal. After excising the scar edges, the two ends were overlapped to recreate the sphincter using 2/0 absorbable monofilament sutures for 3–5 mattress sutures tied from lateral to medial. The skin was closed in a Z-like fashion from the vaginal side to the anal canal, providing more space for the new sphincter and elongating the anovaginal space, using 3/0 absorbable sutures.

Figure 1: Overlapping Sphincteroplasty Pictures

Martius flap- The Martius Flap procedure involved the harvest of a vascularized adipose tissue flap from the labia majora. The flap then transported to the site of the RVF and interposed between the rectal and vaginal closures to reinforce the repair. This technique was effective in cases where the local tissue not normal due to prior surgeries or radiation therapy.

Figure 2: Martius flap pictures

All patients were assessed preoperatively and postoperatively for anal incontinence symptoms using the Wexner scoring scale. Unpaired t test used to analyse the mean comparison.

RESULTS

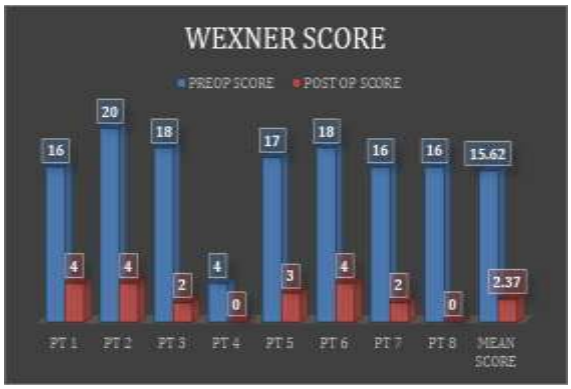
The mean age of participants was 32 years. At presentation all patients had varying degree of fecal and flatus incontinence. All patients had obstetric injury by means of instrumental delivery or episiotomy procedure during vaginal delivery. 3 patients presented earlier in 6 months after perineal injury during obstetric procedure who showed good postoperative outcome with complete resolution of symptoms compared to other 5 patients who presented late after several years All showed symptomatic improvement with significant reductions in Wexner scores and high patient satisfaction rates. One case developed a superficial infection resolved conservatively.

Table 1: Surgical Outcomes and Patient Details

Case No.	Age (Years)	History	Surgery Performed	Follow-Up Findings
1	36	Forceps delivery 10 years back	Direct apposition sphincteroplasty	Symptomatic improvement, no incontinence at follow-up
2	36	Complete perineal tear 16 years	Overlapping sphincteroplasty + Martius flap	Significant Wexner score reduction, high satisfaction
3	22	Perineal tear 5 months back	Overlapping sphincteroplasty + Martius flap	Symptom relief, fistula closure
4	26	Episiotomy 6 months back	Overlapping sphincteroplasty + fistula excision	Feculent discharge resolved
5	45	Episiotomy 25 years back	Overlapping sphincteroplasty	Marked improvement, scar tissue noted
6	38	Obstetric injury 14 years back	Overlapping sphincteroplasty + Martius flap	No symptoms at 2 year follow-up
7	28	Episiotomy 3 years back	Direct apposition sphincteroplasty	Continence restored
8	29	Episiotomy 6 months back	Overlapping sphincteroplasty + Martius flap	Complete symptom resolution

Table 2: Wexner score

PT NO	Wexner score	
	Pre OP score	Post OP score
PT 1	16	4
PT 2	20	4
PT 3	18	2
PT 4	4	0
PT 5	17	3
PT 6	18	4
PT 7	16	2
PT 8	16	0
MEAN SCORE	15.62	2.37
P VALUE	0.001	



DISCUSSION

This single-centre case series of eight patients undergoing delayed secondary repair for obstetric anal sphincter injuries demonstrates significant symptomatic improvement and restoration of continence function, as evidenced by the dramatic reduction in mean Wexner scores from 15.62 preoperatively to 2.37 postoperatively (p=0.001). These findings contribute to the growing body of evidence supporting delayed secondary sphincter repair as a viable and effective treatment option for

women suffering from persistent fecal incontinence following OASIS, whether due to missed initial diagnosis, inadequate primary repair, or delayed presentation.

Surgical Outcomes and Effectiveness: The functional outcomes observed in our series are consistent with previously published literature on delayed sphincter repair. Our mean postoperative Wexner score of 2.37 compares favorably with other studies reporting success rates of 60-85% for overlapping sphincteroplasty in the medium term.[11,12] The statistically significant improvement in continence scores across all patients underscores the potential for meaningful functional restoration even years after the initial injury, with our cohort including patients presenting as late as 25 years post-injury.

Notably, our series included three patients who presented within six months of their obstetric injury, all of whom demonstrated complete resolution of symptoms postoperatively. This observation aligns with emerging evidence suggesting that earlier secondary repair, when primary repair has failed or was inadequate, may yield superior outcomes compared to repairs performed after prolonged delays.[13,14] The better outcomes in early presenters may be attributed to several factors: less fibrotic scarring, better tissue quality and vascularity, preserved muscle bulk, reduced chronic denervation, and potentially higher patient motivation and compliance with postoperative rehabilitation protocols.

In contrast, the five patients who presented after several years still achieved substantial symptomatic improvement, albeit with some residual symptoms in select cases. This finding is clinically important as it provides hope and a therapeutic option for women who may have suffered in silence for years, believing their condition to be irreversible or untreatable. The ability to achieve meaningful functional improvement even decades after injury challenges the notion that there exists a temporal window beyond which surgical intervention becomes futile.

Surgical Technique Considerations: Our surgical approach predominantly utilized overlapping sphincteroplasty (six cases), with two cases employing direct apposition technique. The overlapping technique has been extensively studied and is generally considered the gold standard for secondary repair, offering theoretical advantages of increased surface area for healing, reduced tension at the repair site, and improved functional outcomes compared to end-to-end approximation.[15,16] However, some studies have found comparable outcomes between techniques, suggesting that surgeon experience and patient selection may be as important as the specific surgical approach employed.[17]

The adjunctive use of Martius bulbocavernosus fat pad flaps in four of our cases (50%) represents an important technical consideration, particularly in cases complicated by rectovaginal fistula or those with significant tissue defects. The Martius flap provides well-vascularized tissue interposition, which can enhance healing, reduce the risk of recurrent fistula formation, and potentially improve the success rate of sphincter repair in challenging cases.[18,19] Three of the four cases requiring fistula management (Cases 2, 3, and 8) utilized this technique with excellent outcomes, including complete fistula closure and resolution of feculent discharge. The successful incorporation of Martius flaps in our practice highlights the value of a flexible, individualized surgical approach tailored to the specific anatomical and clinical circumstances of each patient.

The choice between overlapping and direct apposition techniques in our series appeared to be influenced by the extent of sphincter separation, tissue quality, and surgeon preference. Both techniques yielded favorable outcomes in appropriately selected cases, with the two direct apposition cases (Cases 1 and 7) achieving excellent continence restoration. This pragmatic approach recognizes that surgical success depends not solely on technique selection but on comprehensive preoperative assessment, meticulous surgical execution, and appropriate postoperative care.

The mean age of 32 years in our cohort reflects the typical demographic of women affected by OASIS, generally representing patients in their reproductive years. However, the wide age range (22-45 years) and variable time intervals from injury to repair (5 months to 25 years) underscore the heterogeneous nature of this patient population. The prolonged delays in some cases likely reflect multiple barriers to care, including lack of awareness of treatment options, reluctance to discuss bowel symptoms due to embarrassment or cultural stigma, normalization of symptoms as an inevitable consequence of childbirth, limited access to specialized colorectal services, and inadequate screening and follow-up after complicated deliveries.[20]

The observation that Patient 5, who underwent repair 25 years after her initial episiotomy, still achieved marked improvement demonstrates that advanced age and prolonged interval from injury should not be absolute contraindications to surgical intervention. However, realistic counselling regarding expected outcomes is essential, as chronic denervation and progressive muscle atrophy may limit the degree of functional restoration achievable in very delayed presentations.

The low complication rate observed in our series, with only one superficial wound infection that resolved with conservative management, is reassuring and consistent with published complication rates of 5-15% for secondary sphincteroplasty.[21] Common complications reported in the literature include wound infection, dehiscence, fistula recurrence, bleeding, and chronic pain. The absence of major complications in our series may reflect careful patient selection, meticulous surgical

technique, appropriate antibiotic prophylaxis, and attentive postoperative wound care.

The single infection that occurred was managed successfully without compromising the functional outcome, highlighting the importance of vigilant postoperative surveillance and early intervention for wound complications. Given the potential for infection to compromise the repair, strategies to minimize this risk—including preoperative bowel preparation, prophylactic antibiotics, careful surgical technique to minimize tissue trauma, and consideration of diverting stoma in high-risk cases—remain important considerations in surgical planning.

Several avenues for future research emerge from our findings and the broader literature on delayed sphincter repair. Prospective, multicenter studies with larger sample sizes are needed to definitively establish optimal surgical techniques, identify prognostic factors for success and failure, and compare outcomes between different repair approaches. Randomized controlled trials comparing overlapping versus end-to-end techniques, with and without adjunctive procedures such as Martius flaps, would provide higher-level evidence to guide surgical decision-making.[22]

Long-term follow-up studies extending beyond 10 years are essential to understand the durability of repairs and identify factors associated with late deterioration. Such studies should incorporate comprehensive outcome assessment including validated patient-reported outcome measures, quality of life instruments, objective functional testing with manometry, and anatomical assessment with EAUS. Understanding the natural history of repaired sphincters over decades can inform patient counseling and guide decisions about timing of subsequent pregnancies.[23,24]

Emerging therapeutic modalities warrant investigation in the context of OASIS management. Stem cell therapy, involving injection of autologous or allogeneic stem cells into the sphincter complex, has shown promise in preliminary studies for treating various forms of fecal incontinence.[25,26] The regenerative potential of stem cells could theoretically enhance muscle bulk, improve tissue quality, and promote neuroregeneration. However, clinical application remains experimental and requires rigorous evaluation through controlled trials.

Advances in surgical technique, including separate repair of internal and external anal sphincters rather than combined repair, use of biological meshes or scaffolds to augment repairs, robot-assisted or laparoscopic approaches for specific cases, and tissue engineering strategies, may further optimize outcomes. Comparative studies evaluating these innovations against standard techniques are needed to establish their role in clinical practice.

The development and validation of predictive models incorporating clinical, imaging, and physiological variables could enhance patient selection and counseling by estimating individual probabilities of surgical success. Machine learning approaches applied to large datasets may identify complex interactions between variables that traditional statistical methods cannot detect.

CONCLUSION

This case series demonstrates that delayed secondary repair of obstetric anal sphincter injuries can achieve significant symptomatic improvement and restoration of continence function, even years after the initial injury. The dramatic reduction in Wexner scores and high patient satisfaction rates support the effectiveness of this approach in appropriately selected patients. Earlier presentation within six months appears to confer better outcomes, emphasizing the importance of timely recognition and referral of persistent symptoms.

The successful use of various surgical techniques, including overlapping sphincteroplasty with or without Martius flap interposition and direct apposition repair, demonstrates that individualized surgical planning based on anatomical considerations and surgeon expertise can yield favorable results. The low complication rate supports the safety of these procedures when performed by experienced surgeons.

However, several critical limitations temper these conclusions, particularly the absence of objective preoperative and postoperative assessments using EAUS and manometry. Future studies should incorporate these modalities to enhance diagnostic precision, guide surgical planning, and provide objective outcome measures. Prospective studies with larger cohorts, standardized protocols, long-term follow-up, and comprehensive outcome assessment are needed to definitively establish the role of delayed repair in the OASIS management algorithm.

The apparently high rate of missed or inadequately managed initial injuries in our series underscores persistent gaps in OASIS recognition and management despite increased awareness. Enhanced training, systematic examination protocols, and multidisciplinary collaboration are essential to improve early detection and management, ultimately reducing the need for delayed secondary repair.

Delayed secondary sphincter repair represents an important therapeutic option for women suffering from persistent fecal incontinence following OASIS. With appropriate patient selection, meticulous surgical technique, and comprehensive perioperative care including pelvic floor rehabilitation, meaningful functional improvement and restoration of quality of life can be achieved. Continued research, education, and system-level improvements in OASIS prevention, recognition, and management remain essential priorities for optimizing outcomes for this vulnerable patient population.

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