Original Research Article

Role of adynamic graciloplasty in intractable fecal incontinence: initial results from a tertiary centre in South India

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ABSTRACT

Background: Anal incontinence is a socially crippling disorder affecting up to 2% of general population. For patients with extensive sphincter damage who are not willing for permanent colostomy, either artificial bowel sphincter or muscle transposition like graciloplasty remains the last resort. This study was aimed at reporting the outcomes of adynamic graciloplasty in four of our patients with end stage fecal incontinence.

Methods: This was a prospective observational study of all four patients with end stage fecal incontinence who underwent adynamic graciloplasty from January 2014 to January 2016.

Results: Study group included four patients; etiology was perinatal injury in both female patients and penetrating trauma in both male patients. Surgery was uneventful in all cases. FISI scores improved in all cases.

Conclusions: Adynamic graciloplasty is safe and feasible option in surgical management of select cases of intractable fecal incontinence with satisfactory results. It may be offered as a salvage surgery before condemning these patients to permanent colostomy.

Keywords: Adynamic graciloplasty, Anal incontinence, Surgery

INTRODUCTION

Anal incontinence is a socially crippling disorder affecting up to 2% of general population.¹ Common causes include sphincter injury resulting from birth trauma, congenital anal atresia, anorectal surgeries, perineal injuries and spinal cord injuries.² Those patients who fail conservative measures like biofeedback therapy and dietary measures are candidates for sphincteroplasty surgeries based on degree of sphincter defect. For patients with extensive sphincter damage who are not willing for permanent colostomy, either artificial bowel sphincter implantation or surgical repair with autologous muscle remains the last resort.³ Of the various skeletal muscle transposition surgeries used as neo-sphincter described in literature, gracilis muscle transposition also

termed as graciloplasty is widely practiced. Pickrell et al originally described this technique reporting 100% success rate, followed by reports of significant improvement in continence rates by Corman et al and Faucheron et al.⁴⁻⁶ This unstimulated (adynamic) graciloplasty gave way to electrically stimulated (dynamic) graciloplasty based on experimental studies which showed that electrical stimulation of the muscle could transform type II, fatigue-prone muscles into type I, fatigue-resistant muscles.⁷⁻¹⁰

Though the dynamic graciloplasty gained popularity, the outcomes were variable with success rates ranging from 45-80% with higher cost of surgery and higher complications rates.¹¹⁻¹³

This study was aimed at reporting the outcomes of adynamic graciloplasty in four of our patients with end stage fecal incontinence.

METHODS

This was a prospective observational study of all four patients with end stage fecal incontinence who underwent adynamic graciloplasty from January 2014 to January 2016. Demographic data, preoperative parameters and post-operative outcomes were recorded. Assessment of the fecal incontinence severity index (FISI) done preoperatively and at 3 months after surgery were recorded.^{14,15} These patients underwent adynamic graciloplasty for extensive sphincter defect (more than 1/3 of circumference of the muscle based on MRI or trans anal sonography) with intractable fecal incontinence and FISI score >35.

Operative technique

Systemic perioperative antibiotics are administered and deep venous thrombosis prophylaxis are given. Surgery is carried out under general anesthesia in lithotomy position after preoperative bowel preparation. The operative principles outlined by Corman et al in their technique description was followed.¹⁶ Three to four mini-incisions are made along medial border of right thigh and gracilis muscle identified, and traced distally till its tendinous insertion and divided (Figure 1). The muscle is then

further mobilized up to its neurovascular bundle, which is identified and preserved. Two incisions are made lateral to the anus, one on both side and tunnel created around anal canal. Transposed gracilis muscle is tunneled across perianally in clockwise direction and sutured to ipsilateral ischial tuberosity in alpha loop configuration after adducting the thigh. Incision is closed over penrose drain. Protective colostomy was not routinely done.

Postoperatively patient is instructed to avoid excess abduction and sphincter control exercise is taught by way of adduction of thigh at first follow up visit at 2 weeks. In patients with already existing colostomy, colostomy closure was done at 4 weeks after patient has developed good digital rectal tone and is able to retain 100ml of saline instillation per rectally.

RESULTS

Study group included four patients with two males and two females. Etiology was perinatal injury in both female patients and penetrating trauma in both male patients. Two patients had failed sphincter repair earlier and one patient had colostomy in situ. Patient characteristics and imaging features are outlined in Table 1. Surgery was uneventful in all cases. Two patients developed superficial surgical site infection which was managed conservatively. Hospital stay ranged from 6 days to 10 days. There was no mortality in our series. (Table 2).

Table 1: Patient characteristics and imaging features with FISI score.

Patient	Age/ gender	Etiology	Imaging	FISI score pre-op
1	31/male	Perineal trauma with necrotizing fasciitis Colostomy in situ	Ext sphincter defect 2-6 clock	*
2	32/female	Perinatal trauma, failed sphincteroplasty	Sphincter scarring 10- 2 clock	41
3	55/female	Perinatal trauma. Failed sphincteroplasty	Defect with scarring 10- 2 clock	49
4	58/male	Bull gore injury	Defect from 9-2 clock	36

* FISI score not calculated as patient had colostomy in-situ.

Table 2: Perioperative outcomes with FISI score.

Patient	Hospital stay (days)	Morbidity	FISI at 3 months follow-up
1	6	nil	11
2	7	nil	15
3	10	SSI	8
4	8	SSI	4

SSI: surgical site infection.

FISI scores were calculated pre-operatively and at 3 months follow-up as shown in Tables 1 and 2.

Figure 1: The gracilis muscle dissected from origin to insertion.

There was a definite improvement in FISI scores (Figure 2) following surgery and all patients reported an improvement in quality of life. There was no functional deficit of lower limb in all patients.

*FISI score not calculated as patient had colostomy in-situ.

Figure 2: Bar chart comparing pre-operative and post-operative FISI scores.

DISCUSSION

Graciloplasty serves as a last resort option in patients who wish to avoid a permanent stoma for end stage fecal incontinence following extensive sphincter damage or a failed sphincteroplasty.¹³ Though the original adynamic graciloplasty procedure was shown to achieve significant improvement in incontinence rates, it was overtaken by dynamic graciloplasty with the addition of electrical stimulator implantation. In a critical review of literature the overall success rate of dynamic graciloplasty was shown to be 42.9% with an 82.8% risk of postoperative complications. This included a 32.5% risk of need for surgical revision and device explanation.³ These concerns added with the additional cost incurred with electrical pulse generator has renewed the interest in adynamic graciloplasty with a recent comparative study reporting similar functional outcomes in both dynamic and adynamic graciloplasty.¹⁷

All the patients in our study had end stage fecal incontinence defined as FISI score >35. Though various authors adopted epsilon and gamma loop configuration, we followed alpha loop configuration with an aim to avoid excessive mobilization of gracilis muscle and resulting traction on its neurovascular pedicle. There was a definite improvement in incontinence rate in all patients. All the patients regained full continence to solid and liquid feces with occasional leakage of mucus and minor incontinence to gas. There is no uniform consensus of reporting successful outcome in these cases in literature.³

There was no major morbidity or mortality in our series. There was no need for revisional surgery or protective stoma in our series. One of our patients who had undergone permanent stoma underwent stoma reversal following graciloplasty. There was no functional deficit of lower limb resulting from gracilis transposition in our cases.

Our patients did not undergo objective measurement in terms of anal manometry which is limited to select coloproctology centers. Irrespective of the lack of objective manometry data, the ultimate measure of outcome in these surgeries is the impact on patient FISI scores which showed marked improvement. Incontinence severity scores are reported to correlate with quality of life scores.^{18,19} Though our patients reported definite improvement in their quality of life, the same could not be assessed objectively through quality of life scales which need validation of regional translated version.²⁰⁻²²

CONCLUSION

Adynamic graciloplasty is safe and feasible option in surgical management of select cases of intractable fecal incontinence with satisfactory results. It may be offered as a salvage surgery before condemning these patients to permanent colostomy.

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