Student's Journal of Health Research Africa
Vol. 4 No. 9 (2023): September 2023 Issue
https://doi.org/10.51168/sjhrafrica.v4i9.683
Original article

FUNCTIONAL OUTCOMES AND QUALITY OF LIFE OF ANAL INCONTINENCE TREATMENT WITH GRACILIS MUSCLE TRANSPOSITION AS THE PRINCIPAL FLAP: A RETROSPECTIVE STUDY.

Rajesh Kumar, Vikas Kumar*

M. Ch. Department of Plastic Surgery, Patna Medical College and Hospital, Patna, Bihar, India

Abstract.

Background:

Anal incontinence is known to be a highly enfeebling, psychologically affecting condition in a healthy living individual. This condition also leads to low self-esteem, isolation, mental depression, and also lack of confidence. This study deals with the condition of anal incontinence in older patients. The main approach is to monitor the outcome of the transposed gracilis muscle in patients with anal incontinence as a workhorse flap and also to evaluate the patients' improved quality of life.

Materials and methods:

The type of the study was retrospective and a count of 36 patients with the condition anal incontinence was included. All patients were prescribed gracilis muscle transposition.

Results:

The subjects included in this study were multicultural, and the transposition showed a drastic development in their quality of life in both the post-operative score and pre-operative score which indicated notable improvement in the patients.

Conclusion:

This study concludes that Gracilis muscle transposition was never a new technique to be introduced although it is a better choice for treating anal incontinence.

Recommendation:

Various non-surgical treatments like medications, dietary changes, bowel training, stool impaction therapy, etc. are recommended. If these do not work, surgery may be recommended.

Keywords: anal incontinence, quality of life, gracilis muscle transposition, Submitted: 2023-09-20, Accepted: 2023-09-26

1. INTRODUCTION.

Anal incontinence leads to social isolation and an incapacity to work which may entirely change the routine of an individual [1]. The prevalence of this condition is about 10 in 1000 individuals aged over 65 years, which is 2.1% of the total population [2, 3]. It is often referred to lack of ability to restrain the mobility of defecation through the anus and to push it at a socially appropriate place at specific times [4]. People of all ages are affected by this condition, but it is found to be more common in older adults which cannot be considered a sign of aging [5]. Anal incontinence is a compli-

* Corresponding author.
Email address: raj.ms.mot@gmail.com (Vikas Kumar)

cation that has no significance but is very much interconnected to divergent procedures which are similar to these attainable complications [6].

The transposition process of "gracilis muscle for anal incontinence" was established for treating individuals who were not manageable to other medical management [7, 8]. With the widespread of "anal incontinence" and developed surgical procedures, patients with acute "anal incontinence" are rarely obligated to have a stoma which is often permanent [9]. This study is aimed to treat the condition of anal incontinence with the transposed gracilis muscle as a workhorse flap in adult patients.

2. MATERIALS AND METHODS.

2.1. Study design, area, and Participants.

The type of the study was a retrospective which was conducted in Patna Medical College and Hospital, Patna, Bihar. The study sample consisted of 36 patients with the condition of anal incontinence of which 6 were female and 30 patients were male. All six female patients had the condition of anal incontinence caused by high perineal trauma following an RTA. Of the 30 male patients, 8 patients had the condition of anal incontinence by blast injury, 16 patients developed a high perineal trauma by RTA, and 6 patients were due to post-surgical (two had fistulectomy and four patients had a low anterior resection). All the injured patients were diagnosed in the extremity by diversion colostomy, after which these patients were seen with anal incontinence after the closure of the stoma. The age of patients was 18 to 57 years. Late surgical complications were presented with all post-surgical anal incontinence patients of the initial procedure.

2.2. Data Analysis.

The analysis was done in three stages: Hospitalisation of the patients in the Patna Medical College and Hospital on admission, post-operative period and intraoperative period, and an outdoor follow-up of the patients evaluated every two months.

The diagnosis procedure was made with a history of the patient that included asking a few questions about the patient's diet, signs and symptoms, medication, bowel habits, and other health-related conditions. A Digital rectal evaluation was performed to examine the voluntary contraction and resting pressure of the sphincter complex. The health evaluation was an important note of the evaluation for anal incontinence.

As the examiner began the rectal evaluation, an aversion was noted at the anal verge. Sphincter dysfunction was diagnosed if the examining finger experienced a little resistance, and the anus was expanded. The patient was instructed to narrow the sphincter to determine how much mobility control was possible around the examining finger.

2.3. Statistical analysis.

Through descriptive statistics, the data were studied which included percentage, standard deviation, and mean among the patients. The mean scores of operative results were compared with one another. Variations between males and females and the various causes of "anal incontinence", with a point with post- and pre-operative scores, were also evaluated.

3. RESULTS.

A total of 36 patients were included in this study. At the initial stage, a hundred patients were examined for eligibility, however, 64 patients were excluded from this study due to not being eligible. The post-operative mean score and pre-operative mean score with the value of "$P < 0.001$" indicates a notable increase in score [Table 1].

The post-operative mean score and preoperative mean score in males with the value of $P < 0.01$ shows highly significant improvement in score. The post-operative mean score and pre-operative mean scores in females with $P = 0.08$ indicate significant development in score. The post-operative mean score and pre -operative mean score in blast injury patients with $P < 0.001$ indicates highly significant improvement in score.

Table 1: **Overall changes in score.**

All cases	Mean	P
Lifestyle pre-operative FIQL Lifestyle post-operative FIQL	7.60 2.99 7.43	<0.01 <0.01 <0.01
Coping/behaviour pre-operative FIQL Coping/behaviour	2.60 5.95 2.16	<0.01 <0.01 <0.01
post-operative FIQL Depression/self-perception	1.99 0.82	<0.01 <0.01 <0.01
pre-operative FIQL Depression/self-perception	22.77 8.27	<0.01
post-operative FIQL Embarrassment pre-operative FIQL		
Embarrassment post-operative FIQL Total pre-operative		
FIQL Total post-operative FIQL		

The post-operative mean score in Road traffic accident patients and pre-operative mean score with P < 0.001 indicates highly significant improvement in score. The post-operative mean score and pre-operative mean score in post-surgery patients with P = 0.01 indicates significant development in score. Comparing improvement in score, best results occur in post-surgery patients then Road traffic accident patients and then blast injury patients, but this variation was also not highly noticeable [Table 2].

Comparing the variations in mean score between female and male patients, a visible development in male patients, but the difference was not large enough to be noticed [Table 3].

The most common difficulty in this study was perineal pain in 6 patients and hypertrophic scar at donor site in 12 patients mentioned in [Table 4].

Perineal discomfort subsided gradually and also thick raised scars which are abnormal responses to wound healing were not worse to the patients and the condition was manageable. Gluteal wound infection and donating site thigh infection was common post-surgery, and it was treated with daily dressings and antibiotics.

4. DISCUSSION.

During the initial half of the century, the most frequent muscle used for transplant was "gluteus muscle" [10, 11]. The surgery involving gluteus maximus muscle to strengthen the circular muscles in the body called sphincter in children, was described by Chetwood in 1902 [12].

Pickrell et al were the ones to commence gracilis muscle transposition to treat patients with anal incontinence caused by congenital and neurological abnormalities [13]. This procedure involves enfolding the transposed muscle around the anus and wrapping its tip to the opposite side of the inferoposterior aspect of the ischium [14, 15]. The concept is to create a closure in the anus and to fix it up which is similar to the Thiersch procedure. A period of training was given to the patients to relax the muscle and voluntarily contract it.

The contracted muscle along with thigh abduction was made to relax by squatting position to restrict the movement of the leg. Since gracilis is quicker to fatigue, the circularity of the tendinous part was hesitant [16]. This paired with stretching and wrapping will lead to a recircularized tendinous end. Graciloplasty was constantly performed in the US as a support to the artificial bowel sphincter and to restore loss of sphincter muscle [17, 18].

This issue was solved during the initial post-operative days. As an advisory, patients were asked to have easy eating habits and to avoid thigh abduction to prevent excessive stretching of the "transposed gracilis muscle".

As said earlier, the surrounding soft tissues provide blood supply to the tendons [19]. In some studies, it was noted that the transposed gracilis acts as no more than a still sling and it does not act as a dynamic sphincter [20]. Instead, the muscles offer more resistance to outflow. The concept was to analyze the results of the transposed "gracilis muscle" for the treatment of "anal incontinence" in adults and also to determine their de-

Table 2: **Comparison in the improvement of score according to aetiology of incontinence.**

Incontinence Mode	Frequency	FIQL total	Mean	P
RTA Blast injury	22 22 8 8 6	Pre-operative Post-operative Pre-operative Post-operative Pre-operative	23.10 8.28 23.85 10.10 20.10 5.77	<0.01 <0.01
Post-surgery	6	Post-operative		<0.01

Table 3: **Comparison in the improvement of score according to sex.**

Sex	Frequency	FIQL total	Mean total FIQL	P
Male	30 30 6	Pre-operative Post-operative Pre-operative	23.67 8.10 22.77	<0.01
Female	6	Post-operative	9.10	0.08

Table 4: **Complications.**

Complications	Frequency (n)	Percentage (%)
Hypertrophic scar at donor site Perineal pain Gluteal wound infection	12 6 4	33.333 16.667
Donor site infection at thigh Incontinence to liquid foods	4 2	0.111 0.111 0.055

velopment in the quality of life of patients. Comparing the quality of life of "anal incontinent" patients is quite dissimilar and so it has prompted various research to initiate various systems for scoring [21]. However, these scoring systems are complicated, we used the modified fecal incontinence quality of life scale by Rockwood et al in this study [10].

The most investigated transposition procedure for fecal incontinence is Stimulated graciloplasty with high reports between 56% and 94% respectively [22]. Other studies also revealed postoperative evacuatory dysfunction and a high infection rate. Graciloplasty is playing an essential role in the initial approach to "anal incontinence" with increasing experience and developed technology [23]. However elemental research must be performed to increase their application for faecal incontinence and the outcome for myoplasty. Future efforts should be given towards training for surgeons, better selection of patients, and surgical techniques to enhance adequate outcomes and limit injury.

Studies showed that there were a lot of complications involved when artificial circular muscles were used to wrap the anal verge and low rectum [24]. This study comprises patients who are multicultural and at the end of the study, an improvement in the QOL of patients was observed therefore its results are compared with other studies. With post-surgery, in healthy and young male patients a good observation of results was obtained which is also a positive for this study.

5. CONCLUSION.

Based on the findings of the study we have concluded that, with the gracilis muscle transposition technique, the patients with anal incontinence can yield improved quality of life and better results. On assessment of all results, the mean quality of life scores of patients has improved significantly. No other evaluation has obtained enough results with various techniques and hence the transposed Gracilis muscle can act as an ease of harvest flap for the treatment of "anal incontinence" and can

yield betterment. Concurrence and integration are needed in terms of scoring systems and data collection.

6. LIMITATIONS.

The limitations of this study include that the anal sphincters and posterior surface of pubic bones exerted pressure during rest and contraction post and pre-operatively. Anorectal manometry records were not available and so the adynamic myoplasty was studied.

7. RECOMMENDATION.

Various non-surgical treatments like medications, dietary changes, bowel training, stool impaction therapy, etc. are recommended. If these do not work, surgery may be recommended.

8. ACKNOWLEDGEMENT.

We are thankful to the patients; without them, the study could not have been done. We are thankful to the supporting staff of our hospital who were involved in the patient care of the study group.

9. LIST OF ABBREVIATIONS.

RTA- Renal Tubular Acidosis
FIQL- Fecal incontinence quality of life
QOL- Quality of Life

10. SOURCE OF FUNDING.

The study was not funded.

11. CONFLICT OF INTEREST.

The authors report no conflicts of interest in this work.

12. PUBLISHER DETAILS.

Publisher: Student's Journal of Health Research (SJHR)
(ISSN 2709-9997) Online
Category: Non-Governmental & Non-profit Organization
Email: studentsjournal2020@gmail.com
WhatsApp: +256775434261
Location: Wisdom Centre, P.O.BOX. 148, Uganda, East Africa.

13. REFERENCES.

1. Kaiser AM. ASCRS core subjects: Fecal incontinence. Annual Meeting: ASCRS; 2012.
2. Wolff BG. The ASCRS Textbook of Colon and Rectal Surgery. New York: Springer; 2007. p. 653-64.
3. Yamada T, Alpers DH. Textbook of Gastroenterology. Vol. 5. Chichester, West Sussex: Blackwell Publishing; 2009. p. 1717-44.
4. Norton C, Thomas L, Hill J, Guideline Development G. Management of faecal incontinence in adults: Summary of NICE guidance. BMJ 2007;334:1370-1.
5. Abrams P. Pathophysiology of urinary incontinence, faecal incontinence and pelvic organ prolapse. Incontinence: 4th International Consultation on Incontinence. Vol. 4. Paris: Paris Health Publications; 2009. p. 255.
6. Zbar AP, Wexner SD, editors. Coloproctology. New York: Springer; 2010. p. 109-19.
7. Abrams P. Epidemiology of urinary (UI) and faecal (FI) incontinence and pelvic organ prolapse (POP). Incontinence: 4th International Consultation on Incontinence. Vol. 4. Paris: Paris Health Publications; 2009. p. 35.

8. Ommer A, Wenger FA, Rolfs T, Walz MK. Continence disorders after anal surgery – a relevant problem? Int J Colorectal Dis 2008;23:1023-31.
9. Rieger N, Wattchow D. The effect of vaginal delivery on anal function. Aust N Z J Surg 1999;69:172-7.
10. Rockwood TH, Church JM, Fleshman JW, Kane RL, Mavrantonis C, Thorson AG, et al. Fecal incontinence quality of life scale: Quality of life instrument for patients with fecal incontinence. Dis Colon Rectum 2000;43:9-16.
11. Sangwan YP, Coller JA. Fecal incontinence. Surg Clin North Am 1994;74:1377-98.
12. Chetwood CH. Plastic operation of the sphincter ani with report of a case. Med Rec 1902;61:529.
13. Pickrell KL, Broadbent TR, Masters FW, Metzger JT. Construction of a rectal sphincter and restoration of anal continence by transplanting the gracilis muscle; a report of four cases in children. Ann Surg 1952;135:853-62.
14. Mander BJ, Wexner SD, Williams NS, Bartolo DC, Lubowski DZ, Oresland T, et al. Preliminary results of a multicentre trial of the electrically stimulated gracilis neoanal sphincter. Br J Surg 1999;86:1543-8.
15. Wexner SD, Baeten C, Bailey R, Bakka A, Belin B, Belliveau P, et al. Long-term efficacy of dynamic graciloplasty for fecal incontinence. Dis Colon Rectum 2002;45:809-18.
16. Wexner SD, Gonzalez-Padron A, Rius J, Teoh TA, Cheong DM, Nogueras JJ, et al. Stimulated gracilis neosphincter operation. Initial experience, pitfalls, and complications. Dis Colon Rectum 1996;39:957-64.
17. Matzel KE, Madoff RD, LaFontaine LJ, Baeten CG, Buie WD, Christiansen J, et al. Complications of dynamic graciloplasty: Incidence, management, and impact on outcome. Dis Colon Rectum 2001;44:1427-35.
18. Yoshioka K, Keighley MR. Clinical and manometric assessment of gracilis muscle transplant for fecal incontinence. Dis Colon Rectum 1988;31:767-9.
19. Mowatt G, Glazener C, Jarrett M. Sacral nerve stimulation for fecal incontinence and constipation in adults: A short version Cochrane review. Neurourol Urodyn 2008;27:155-61.
20. Schrag HJ, Ruthmann O, Doll A, Goldschmidtböing F, Woias P, Hopt UT. Development of a novel, remote-controlled artificial bowel sphincter through microsystems technology. Artif Organs 2006;30:855-62.
21. Parisien CJ, Corman ML. The Secca procedure for the treatment of fecal incontinence: Definitive therapy or short-term solution. Clin Colon Rectal Surg 2005;18:42-5.
22. Corman M. Gracilis muscle transposition for anal incontinence: Late results. Br J Surg 1985;72(Suppl):S21–S22
23. Sielezneff I, Bauer S, Bulgare JC, Sarles JC. Gracilis muscle transposition in the treatment of faecal incontinence. Int J Colorectal Dis 1996;11:15-8.
24. Eccersley AJ, Lunniss PJ, Williams NS. Unstimulated graciloplasty in traumatic faecal incontinence. Br J Surg 1999;86:1071-2.