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GRACILIS MUSCLE SPHINCTEROPLASTY FOLLOWING ABDOMINOPERINEAL RESECTION: A CASE REPORT
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SUMMARY

Abdominoperineal resection (APR) is one of several surgical procedures indicated for treating colorectal carcinoma. APR involves the removal of the distal colon, the rectum, and the anal sphincters, resulting in a permanent colostomy. Permanent colostomies are associated with multiple complications including a low quality of life. Anal reconstruction, using the gracilis muscle for sphincter control is a viable alternative to a permanent colostomy.

This is the case of a 43-year-old woman who requested the reversal of a permanent colostomy. She had a Hartman's colostomy fashioned after undergoing an abdominoperineal resection and total abdominal hysterectomy for a suspected colorectal carcinoma. On her request, colostomy reversal and gracilis muscle sphincteroplasty were performed. Eight months after the procedure, she achieved good continence, improved feeding, and gained about 13 kilograms in weight. The successful colostomy reversal and gracilis sphincteroplasty demonstrated the effectiveness of graciloplasty in restoring patients' continence.

CASE PRESENTATION

A 43-year-old woman presented with a wish to have a permanent colostomy reversed. The woman had a Hartman's colostomy port that was created after undergoing an abdominoperineal resection and total abdominal hysterectomy for a suspected colorectal carcinoma. The diagnosis was based on a history of abdominal pain and inability to pass stool. A colonoscopy revealed a non-ulcerated polypoid mass causing partial obstruction at the rectosigmoid junction. Biopsy and subsequent histopathology indicated normal colonic mucosa, but no signs of malignancy. The diagnosis was further supported by features of malignancy on abdominopelvic CT scan with a staging of T2-3, N1, M0.

Consequently, the patient underwent abdominoperineal resection, a total abdominal hysterectomy, and a permanent colostomy was fashioned. Histopathology of the resected colon, rectum, anus, and the uterus revealed extensive endometriosis and no signs of malignancy.

The plan was to pull the distal colon to the perineum and use the gracilis muscle flap to reconstruct the sphincter. The procedure was described in detail to the

patient including the possibility of continence failure. The patient decided to proceed with the surgery and informed consent was obtained. The surgery was performed with the patient under general anesthesia and in lithotomy position.

Intraoperative findings included a Hartman's colostomy and an absent anal opening with no anal sphincter tone (Figures 1 and 2). First, a laparotomy was performed and adhesions in the pelvis were released. The stoma was mobilized into a new anal opening and sutured in place. The left gracilis muscle was identified, (Figure 3) detached distally and wrapped around the new anus in an anticlockwise direction and its tendon was stitched to the periosteum of the ipsilateral inferior pubic ramus with the thigh adducted. This created a sling around the neo-anus. Throughout the procedure, care was taken to prevent twisting of the muscle. An index finger inserted into the neo-anus had the sensation of being firmly gripped. Hemostasis was achieved before wound closure. The abdomen was closed in layers. The donor site for the gracilis muscle was closed and dressing was performed.

While in the ward the patient was positioned with lower limbs adducted at all times.



Figure 1: Intraop findings, Hartman's colostomy



Figure 2: Intraop findings, absent anal opening



Figure 3: Marking of the left gracilis muscle donor site

RESULTS

She had a good post-operative outcome. While in the ward she had some perianal soiling but with a reasonable stool control and was discharged home on day 7 post-surgery.

At 4 weeks post-surgery, stool control was improving but with occasional soiling. Continence improved such that by 4 months she was continent for both flatus and stool.

At 8 months she had achieved good continence and we decided to assess her continence objectively using the Vaizey continence score (1). She scored 2/24; (Table 1) the 2 points were due to occasional incontinence to liquid stool. She reported an improvement in her quality of life with a weight gain of 13 kilograms from the time of surgery.

Table 1: The Vaizey continence score at 8 months (1)

Incontinent	Never	Rarely	Sometimes	Weekly	Daily
Incontinent for solid stool	0	0	0	0	0
Incontinent for liquid stool	0	0	2	0	0
Incontinent for gas	0	0	0	0	0
Alterations in lifestyle	0	0	0	0	0
		No		Yes	
Need to wear pad or plug		0		0	
Taking constipation medication		0		0	
Lack of ability to defer defecation for 15 mins		0		0	
Total Score			2		

Never: no episodes in the past 4 weeks; **Rarely:** 1 episode in the past 4 weeks; **Sometimes:** >1 episode in the past 4 weeks, but <1 a week; **Weekly:** 1 or more episodes a week but <1 a day; **Daily:** 1 or more episodes a day

DISCUSSION

Aggressive surgical treatment is indicated in the management of colorectal carcinoma. Abdominoperineal resection (APR) is one of the surgical options and is indicated for low-lying rectal carcinomas within 5cm of the anal verge. In APR, the distal colon, the rectum, and the anal sphincters are removed resulting in a permanent colostomy (2).

It is not uncommon for intestinal endometriosis to mimic colorectal carcinoma. Kim et al reported five cases of misdiagnosis; intestinal endometriosis presented with colonoscopy and radiologic findings similar to those observed in colorectal carcinoma. Histopathology results of the surgical specimens however revealed endometrial tissue (3). In this case, both the CT imaging results and colonoscopy examination pointed to colorectal carcinoma as the most probable diagnosis although the biopsy results were inconclusive of malignancy. Histopathology of the surgical specimens revealed endometrial tissue and no malignancy. The results of this case and previous reports by Kim et al highlight the need to consider endometriosis as a differential in reproductive women presenting colorectal carcinoma-like symptoms.

Although APR often requires the fashioning of a permanent colostomy, colostomies are less than ideal. They lower the quality of life by creating a negative sense of body image, affecting emotional well-being and overall mental health. Additionally, colostomies are associated with complications such as peristomal infections and ischemia of the colostomy (4). In this case, the patient's main concern was the permanent colostomy affecting her quality of life thus influencing her to request for a reversal.

Cases of reversal of permanent colostomies after APR have been documented. Puerta Diaz et al reported successful reversal of permanent colostomies in seven patients. The seven patients had undergone APR due to rectal adenocarcinoma. The sigmoid colon was anastomosed to the perineum and sphincteroplasty was performed by transposing the gluteus maximus muscle. The outcome was excellent sphincter function in four of the seven patients (5). In similar cases involving anorectal reconstruction and sphincteroplasty, graciloplasty has been widely applied. High success rates of 42% to 85% have been reported with graciloplasty (6). In the long term, stimulated graciloplasty has proven cost-effective compared to permanent colostomy (7).

In this case, the sigmoid colon was pulled down to create the neo-anus. Sphincteroplasty involves

the transposition of the gracilis muscle. Continence improved in the weeks and months following the procedure. Eight months postoperatively, the patient had achieved remarkable continence and had a Vaizey continence score of 2/24. The reversal procedure had a positive impact on the patient's quality of life as evidenced by the self-reported improvement in feeding and the 10 kilograms weight gain observed 8 months after the procedure was performed.

The main challenge is injury to the branch of the obturator nerve during the procedure. The limitations of the procedure is in relation to the training of the transferred muscle and the occasional necessity for transanal stimulation.

In conclusion, the successful colostomy reversal and gracilis sphincteroplasty demonstrated the effectiveness of graciloplasty in restoring patients' continence. This is better than a permanent colostomy following the APR procedure. Patients record an improvement of their quality of life after permanent colostomy reversal procedure. Gracilis sphincteroplasty should be considered in patients who are not comfortable with a permanent colostomy.

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