USE OF ANORECTAL MANOMETRY FOR OBJECTIVE ASSESSMENT OF ANORECTAL FUNCTION AFTER POUCH ILEOANAL ANASTOMOSIS

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ABSTRACT

Sixteen patients of ulcerative colitis and two of familial adenomatous polyposis were subjected to anorectal manometry, a minimal of three months after Pouch Ileo-Anal Anastomosis and closure of ileostomy. Using a perfusion catheter the parameters measured were resting anal pressure (RAP), maximum squeeze pressure (MSP), pouch volume and compliance at maximum tolerated volume. Subjective evaluation included anal continence and frequency of stools. The subjective functional results after surgery were then correlated with the objective findings of manometry. 4/18 patients (22%) had nocturnal incontinence only, while one patient (5%) had incontinence both by day and night. Frequency of stools was < 8/day in 10/18 patients (55%). Only 1/5 patients (20%) with incontinence had anal sphincter pressures greater than the controls while only 3/13 continent patients (22%) had anal sphincter pressures less than the controls. The study shows that low anal sphincter pressures are associated with post-operative incontinence and that there is a correlation between decreased frequency of stools and increased pouch volume as well as pouch compliance.

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KEYWORDS : Anal sphincter pressures; Pouch ileoanal anastomosis; Pouch compliance; Pouch volume; Ulcerative colitis.

Introduction

Total proctocolectomy and pouch ileo-anal anastomosis (PIAA) has become the operation of choice for patients with chronic ulcerative colitis and familial adenomatous polyposis [1]. The advantages of this technique are that all diseased mucosa is removed, an abdominal stoma is avoided, the anal sphincters are preserved and the transanal path of fecal flow is maintained. The logic of this procedure is persuasive, but the reported results are variable particularly with reference to anal continence and number of stools per day [2,3]. If the technique and the surgical results are to be improved then the post-operative physiological status would need to be evaluated in relation to clinical results. Much interest had been focused on anal sphincter function after restorative proctocolectomy and PIAA. In this study we have used anorectal manometry for objective assessment of function and correlated them with clinical outcome in patients undergoing PIAA after total proctocolectomy.

Material and Methods

Anorectal manometry was carried out using a microprocessor based perfusion system with a solid state transducer with inbuilt algorithms for storage and online analysis of data. Between Apr 93 and Apr 95, sixteen patients of ulcerative colitis and two of adenomatous polyposis were subjected to anorectal manometry, a minimum of three months after PIAA and closure of ileostomy. These were compared with manometry results of 15 controls. The parameters measured were resting anal pressure (RAP), maximum

squeeze pressure (MSP), maximum tolerated pouch volume and pouch compliance. The patient was placed in the left lateral position with the hips flexed almost 90°. The perfusion catheter was then introduced into the anal canal and the RAP was recorded. Using the same position of the catheter the patient was asked to maximally squeeze his anal sphincter for recording the MSP. For recording the pouch volume and its compliance a longitudinal balloon with the same pressure recording device was introduced into the ileal pouch and slowly filled with saline. The compliance was worked out in ml of water/cm rise of water pressure in the balloon. The maximum tolerated pouch volume and compliance were the reading when the patient complained of pain and could not tolerate any further saline instillation. Subjective evaluation at the time of manometry included anal continence by day and night and number of stools per day.

Students unpaired 't' test and regression analysis was used for statistical evaluation of data.

Results

The mean age of the controls was 30.4 years (range 13-65). In the same group anorectal manometry showed that the mean RAP was 65 ± 37.8 cm of water and MSP was 135 ± 83.2 .

Sixteen patients of ulcerative colitis and two of adenomatous polyposis who were evaluated post operatively by anorectal manometry showed that they had a mean age of 31.6 years (range 14-54). There were 12 males and six females in this group. Subjective evaluation of the same group at the time of anorectal manometry revealed that the mean number of stools passed per day was 8.5 (range 3-19). As regards anal continence 4/18 patients (22%) had nocturnal incontinence and one patient was incontinent both by day and night.

Anorectal manometry in the 18 operated patients showed a mean RAP of 42.2 ± 35.6 cm of water and a mean MSP of 106 ± 100.5 cm of water. These results when compared with RAP and MSP of the control group showed that there was a significant

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fall in RAP after surgery ($p < 0.001$), while the difference in the MSP in the two groups was not statistically significant.

In this study 5/18 patients (28%) had some degree of incontinence after PIAA. These five patients had a mean RAP of 33.6 ± 27.6 cm of water and a mean MSP of 79.2 ± 63.5 cm of water. When compared with the rest of the operated group the decrease in RAP of the incontinent patients was statistically significant ($p < 0.05$) while there was no significant difference in the MSP of the two groups.

Study of the maximum tolerated pouch volume and pouch compliance in the operated group revealed a mean pouch volume of 223.3 ± 211.7 ml and mean compliance of 3.8 ± 6.19 ml/cm of water. When these results were correlated by regression analysis, it was found that there was a significant correlation between number of stools and maximum pouch volume ($r = -0.6$, $p < 0.05$) and number of stools with pouch compliance ($r = -0.58$, $p < 0.05$). These results show that in patients after PIAA the higher the pouch volume the lesser was the number of stools per day and also the greater the pouch compliance the lesser was the number of stools per day.

Discussion

The mechanism of continence depends on several factors including the function of anal sphincters [4]. The internal anal sphincter is thought to contribute about 80 per cent of the RAP and the external sphincter about 20 per cent [5]. The MSP is mainly the function of the external sphincter. Keighley et al found that RAP decreases in patients after PIAA [6], as was also seen in this study. O'Connell also reported that after PIAA the anal squeeze pressures are largely unchanged [7].

5/18 patients in our study had some degree of incontinence after surgery and in this group the RAP was significantly lower than the rest of the group. Again in this group too the MSP in incontinent patients did not show a significant difference from the rest of the group. However this is contradictory to the earlier studies which have shown that the RAP and MSP are preserved after PIAA [8,9]. In a study of 30 patients after PIAA, Keighley found a significant decrease in both RAP and MSP after surgery [6]. Low RAP reflects an impaired internal anal sphincter function and is thought to be responsible for increased incidence of soiling especially at night [10]. Sun et al reported that patients with post operative soiling after restorative proctocolectomy had an unstable internal anal sphincter and lower minimum basal pressure [11].

Increased number of stools per day is another common problem faced by patients after restorative proctocolectomy. We found a significant correlation between number of stools per day and pouch capacity and also number of stools per day and pouch compliance. Heppell et al have reported that in patients after PIAA the greater the maximum tolerated pouch vol-

ume the less was the number of stools per day [9]. They also found that in all patients the greater the compliance the greater was the maximum tolerated pouch volume. A similar observation was made by Beart et al in that a decreased pouch capacity and pouch compliance correlated directly with increased stool frequency and decreased continence [8]. However, Keighley reported that impaired pouch compliance was not associated with a poor functional result.

Although the mechanism of anal continence and the number of stools per day after restorative proctocolectomy are complex, we found that there is a significant decrease in RAP after PIAA. Patients who develop post operative incontinence also have a lower RAP. Finally there is a significant correlation between increased pouch volume and compliance and decreased number of stools per day.

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