

Outcome after ileal pouch-anal anastomosis for familial adenomatous polyposis compared to mucosal ulcerative colitis in a Middle Eastern population

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BACKGROUND AND OBJECTIVES: To compare the complications and outcome after ileal pouch-anal anastomosis (IPAA) for mucosal ulcerative colitis (MUC) and familial adenomatous polyposis (FAP).

DESIGN AND SETTINGS: This is a retrospective study. The study was conducted at a single tertiary referral center.

METHODS: All patients who underwent restorative proctocolectomy with IPAA at a tertiary center in Saudi Arabia from 2001 till 2009 were retrieved. Data was obtained regarding preoperative status, postoperative complications, and functional outcome.

RESULTS: A total of 40 patients underwent IPAA, of which 21 cases were of FAP and 19 cases of MUC. Median age at operation for FAP and MUC was 31 (range: 16-45) and 43 (range: 15-65) years, respectively ($P < .05$). Median length of stay was 10 days (range: 6-42) for FAP and 12 days (range: 9-27) for MUC ($P = .1$). Postoperative morbidity was noted in 4 cases of FAP and 6 cases of MUC ($P = .36$). Specifically, wound infection was noted in 2 cases of FAP compared to 3 cases of MUC ($P = .55$); 1 MUC case had an anastomotic leak ($P = .29$). One mortality was recorded among the FAP cases ($P = .35$). The time between the creation of IPAA and the closure of ileostomy was 4.5 and 5 months for FAP and MUC, respectively ($P = .87$). Median follow-up was 36 months. Median bowel frequency per 24 hours was 6 (range: 3-24) for FAP and 7 (range 3-17) for MUC ($P = .54$). Intestinal obstruction was reported in 3 cases of FAP and 5 cases of MUC ($P = .38$). One pouch was excised in a FAP patient. One case of MUC developed pouchitis.

CONCLUSIONS: The outcome after IPAA was inferior for MUC compared to FAP, but it was not statistically significant due to the small sample size. The morbid status of the MUC cases and their older age contributed to the minor differences.

Restorative proctocolectomy with the formation of an ileal pouch-anal anastomosis (IPAA) was introduced by Parks AG and Nicholls RJ in 1978 for mucosal ulcerative colitis (MUC).¹ Several years later, it became the first choice for both MUC and familial adenomatous polyposis (FAP).²⁻⁴ Many researchers over the last 30 years had studied this procedure with regard to the short- and long-term outcome. Some of them concluded that the functional outcome was better and the complications were less in FAP patients than in MUC patients^{2,5} while others found them

similar. In Saudi Arabia there was a single report about 30 patients who underwent IPAA; however, the differences between FAP and MUC cases have not been studied. We reported a single center experience over 9 years with the procedure in Saudi patients and compared the outcome among FAP and MUC patients.

METHODS

The colorectal database at King Faisal Specialist Hospital and Research Center, Riyadh, Saudi Arabia, was reviewed from 2001 till 2009 for all patients who

underwent IPAA. Patients who underwent IPAA for reasons other than FAP and MUC were excluded. IPAA was constructed using a J-ileal loop according to the stapled technique described by Kmiot WA, and Keighley MR. The ileoanal anastomosis was constructed using a double-stapled or hand-sewn technique. Mucosectomy was not performed in FAP patients unless the pouch was anastomosed to more than 1 cm above the dentate line. All pouches were covered with a loop ileostomy. From 2008, some cases were performed using a laparoscopic-assisted approach. All patients were operated electively. They received a prophylactic antibiotic and mechanical bowel preparation. Some patients received blood transfusion and some received preoperative total parenteral nutrition (TPN) when indicated. Early complications like septic episodes and mortality were documented. The first follow-up was 1 month after the operation, then every 6 months for 2 years, and yearly thereafter. Histopathology was reviewed for all cases. Late complications, frequency of bowel motions, incontinence symptoms, and use of constipating agents were recorded.

SPSS, version 17.0.1 (IBM Corporation), was used for analysis; the comparison of variables was conducted using a chi-square test or Fisher exact test. A 2-sample Kolmogorov-Smirnov test was used to compare the medians. A *P* value less than .05 was considered significant.

RESULTS

A total of forty patients underwent IPAA: 19 females and 21 males. There were 21 cases of FAP and 19 cases of MUC. The median age at operation for FAP and MUC was 31 (range: 16-45) and 43 (range: 15-65) years, respectively, which was significantly different ($P=.02$). No cases of diabetes mellitus were recorded among both groups. Six cases of MUC were on steroids. Hypertension was reported in 1 case of FAP and 2 cases of MUC. A total of 9 cases of FAP and 10 cases of MUC were anemic. Only 4 cases underwent laparoscopic-assisted technique and 2 cases underwent hand-sewn anal anastomosis.

The median length of hospital stay was 10 days (range: 6-42) for FAP and 12 days (range: 9-27) for MUC ($P=.1$). The time between creation of IPAA and closure of ileostomy was 4.5 and 5 months for FAP and MUC, respectively ($P=.87$). TPN was given to 5 cases of MUC and 1 case of FAP ($P=.06$). A total of 9 cases of FAP received blood transfusion, of which 6 were anemic preoperatively in comparison to 11 cases of MUC and 8 were anemic preoperatively ($P=.34$). In general, postoperative morbidity was reported in 4 cases of FAP

and 6 cases of MUC ($P=.36$). The details of these complications are shown in **Table 1**. There was 1 mortality after IPAA creation for FAP due to unexplained disseminated intravascular coagulation.

The median number of bowel movements for FAP cases was 4 in the daytime (range 3-20) and 2 in the nighttime (range 0-4). For MUC cases, it was 6 (range: 3-12) and 1 (range: 0-5), respectively. No significant difference in the functional outcome was recorded between FAP and MUC cases as shown in **Table 2**. The use of constipating agents was significantly higher among MUC cases compared to FAP cases at 11 to 5 cases, (MUC, 11 cases; FAP 5 cases) ($P=.01$). The median follow up was 36 months. No significant difference was observed between FAP and MUC cases in late complications, the details of which are shown in **Table 3**.

DISCUSSION

The time to refer to surgery was reflected by the age at operation. The median age at operation for FAP

Table 1. Early complications.

Complications (≤ 30 d)	FAP (n=21)	MUC (n=19)
Pelvic sepsis (collection)	2	2
Wound infection	2	3
Anastomotic leak	0	1
Total	4	6

FAP: Familial adenomatous polyposis, MUC: mucosal ulcerative colitis.

Table 2. Functional results.

Type of incontinence	FAP (n=21)	MUC (n=19)
Incontinence to gas	2	1
Incontinence to liquid	1	0
Incontinence to solid	0	0
Nocturnal soiling	4	5

FAP: Familial adenomatous polyposis, MUC: mucosal ulcerative colitis.

Table 3. Late complications.

Complications (>30 d)	FAP	MUC	Total
Intestinal obstruction	3	5	8
Incisional hernia	0	3	3
Pouch fistula	0	1	1
Pouchitis	0	1	1
Pouch excision	1	0	1

FAP: Familial adenomatous polyposis, MUC: mucosal ulcerative colitis.

cases was 31 years; this coincided with international reports,^{2,6,9-11} where the median age ranged between 26 and 31 years. However, international reports of IPAA for MUC recorded a median age of 32 to 35 years at operation.^{2,6,11,12} In our series, the median age at operation for MUC was 43 years. This indicated late referral for surgery. Late referral led to more MUC cases being nutritionally depleted at the time of operation, and 53% of them were anemic. This most probably contributed to more complications among MUC cases, although it did not reach significance due to the small sample size of our study population. It is noteworthy to mention that TPN was received mainly by MUC cases.

The median length of stay is a reflection of 2 factors: the morbid status of the patients and the type of the health care system. The health care delivery system in Saudi Arabia is a national health service that is free. There is more tendency for patients in such systems to stay longer in the hospital.^{13,14} Reports from the United Kingdom and the Netherlands gave a hospital stay of 15 days.^{15,16} The situation is even more apparent if we consider the Veterans Affairs hospitals in the United States where patients have reached an average stay of 36 days according to some reports.¹⁷ This is in contrast to health care systems where patients pay through insurance or medical saving funds. In such systems, the median length of stay was 8 to 10 days.^{5-6,18} In our series, the patients stayed for 10 days for FAP and 12 days for MUC. This fell in between the health care systems where patients pay for their care and free national health service systems. The length of stay for MUC cases was longer since they were more morbid. Our results of shorter than expected length of stay in a free national health service was a reflection of an ef-

ficient coordination team that was available to provide care and support after the discharge of the patients alleviating the patients' anxiety toward early discharge. It included a patient education/counselor, a discharge planner, and 24/7 hotline answering service. Four patients underwent laparoscopic-assisted ileal pouch creation, but their stay was not less as they were part of an early learning curve experience.

Wound infection was noted more frequently in our series at 12.5%. This is higher than an earlier report by Isbister⁷ from Saudi where he reported a rate of 6.7%. Reports from other centers ranged between 1.6% and 8.2% (Table 4). Wound infection in our series had been diagnosed following the CDC definition.²³ Moreover, the diagnosis was made by a third party to avoid the bias of the operating surgeon; in this case, it was the enterostomal therapist. The data was also collected prospectively to avoid further bias. We believe our rate had been increased due to these reasons, which were not strictly followed up in other reports. Besides these, other factors like anemia, malnourishment, and use of steroids increased the risk of septic complications.²⁴⁻²⁶

The rate of bowel obstruction ranged between 6.4% and 26.7% in the published studies.^{6-7,9,19-21} Fazio et al⁶ reported a rate of 25.3%. In our series, the rate was 20%, and more was noted among MUC cases. Only 1 patient required reoperation due to an ileal pouch volvulus. Table 5 shows our late complication rate compared to international reports.

Although bowel function was not significantly different between FAP and MUC cases, one could not overlook the fact that the similarity between the 2 was at the expense of more usage of constipating agents by MUC cases (Table 6). Although it did not reach signifi-

Table 4. Early complications (≤ 30 d).

Author	Year	No.	Mortality (%)	Wound infection (%)	Pelvic sepsis (%)	Anastomotic leak (%)
Current study	2011	40	2.5	12.5	10	2.5
Nicholls et al ¹⁹	1984	66	0	6.1	27.2	-
Setti-Carraro et al ²⁰	1994	110	0.9	8.2	8.2	5.5
Fazio et al ⁶	1995	1005	1	5.8	8.2	2.9
Nyam et al ⁹	1997	187	0	1.6	1.6	-
Isbister ⁷	2000	30	0	6.7	-	3.3
Michelassi ²¹	2003	391	0.5	-	1.3	6.4
Lovegrove et al ²²	2006	4183	2.4	-	7.2	6.9

Table 5. Late complications (>30 d).

Author	Year	No.	Intestinal obstruction (%)	Pouch fistula (%)	Pouchitis (%)	Pouch excision (%)	Overall late complication (%)
Current study	2011	40	20	2.5	2.5	2.5	35
Nicholls et al ¹⁹	1984	66	6.4	1.6	-	4.5	51
Setti-Carraro et al ²⁰	1994	110	8.2	5.5	27	15	-
Fazio et al ⁶	1995	1005	25.3	9.4	23.5	3.4	50.5
Nyam DC et al ⁹	1997	187	13	-	3	3	-
Isbister ⁷	2000	30	26.7 ⁷	3.3	7	6.7	-
Michelassi et al ²¹	2003	391	11.2	-	-	3.4	-
Lovegrove et al ²²	2006	4183	-	4.7	16.8	3.8	-
Walker and Bulow ²⁷	2008	178	-	3	12	2	29

Table 6. Functional outcome.

Author	Year	No.	Median number of bowel motions				Use of constipating agents (%)	
			Daytime		Night-time		FAP	MUC
			FAP	MUC	FAP	MUC		
Current study	2011	40	4	6	2	1	23	58
Dozois ²	1989	582	5	5	1	1	37	57
Fazio ⁶	1995	1005	5	6	-	-	56	62
Isbister ⁷	2000	30	4.7 ^a	6 ^a	0.4 ^a	2 ^a	-	-

^aMean. FAP: Familial adenomatous polyposis, MUC: mucosal ulcerative colitis.

cance, MUC cases had a higher number of bowel movements. This observation was noted by Fazio et al as he reported frequencies for both FAP and MUC cases at 5 and 6 per 24 hours, respectively; while it was 6 and 7 in our study population, respectively. He did not comment if this was a significant difference. The difference was more marked in the earlier report by Isbister; he reported a frequency for 24 hours of 5.1 and 8 for FAP and MUC cases, respectively. Therefore, it is a consistent finding that MUC patients have a slightly inferior functional outcome compared to FAP patients as exemplified by the higher frequency and fecal soiling (Table 6). However, this is improved through the use of constipating agents.

The reason the bowel frequency is higher in the

Saudi population compared to the Western population lies in the cultural differences. Saudis as Muslims must pray 5 times per day and for each prayer must perform ablution. Furthermore, they must avoid breaking wind or staining their underwear after the ablution until the prayer is finished. Therefore, most patients are encouraged by the religious scholars prior to an ablution to evacuate their bowels to avoid such an event. This increases their reported frequency.²⁸

In conclusion, the outcome after IPAA for MUC was worse than for FAP; however, it did not reach statistical significance due to the small sample size. Probably, the minor differences noted between FAP and MUC cases were related more to the morbid status of the MUC cases and their older age rather than the surgery itself.

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