

## Ileal pouch-anal anastomosis: pregnancy, delivery and pouch function

H. J. Scott, R. S. McLeod, J. Blair, B. O'Connor, Z. Cohen

The Inflammatory Bowel Disease Centre, University of Toronto, Toronto, Ontario, Canada  
The Division of General Surgery, Mount Sinai Hospital and the University of Toronto, Toronto, Ontario, Canada

Accepted: 10 December 1995

**Abstract.** *Objective:* To evaluate the pregnancies, deliveries and functional results of patients who have undergone and ileal pouch-anal anastomosis. *Design:* A retrospective survey by questionnaire. *Setting:* The study was conducted at a university hospital. *Subjects:* Twelve women who had undergone an ileal pouch-anal anastomosis at the Inflammatory Bowel Disease Centre, Mount Sinai Hospital and who had subsequently become pregnant, were identified from the hospital records. A follow up questionnaire was completed by all subjects. *Results:* Twelve patients had 16 deliveries. There were 10 vaginal deliveries and 6 caesarian sections. There were no pouch-related complication during the 16 pregnancies and there were two postpartum complications. *Conclusions:* Pregnancy is safe in women with an ileal pouch-anal anastomosis. Functional results are altered minimally. Vaginal delivery is safe and obstetric reasons should determine whether a caesarian section is performed.

**Résumé.** *But:* Evaluer les grossesses, accouchements et résultats fonctionnels de patients qui ont subi la confection d'une poche iléo-anales. *Moyen:* Une étude rétrospective avec questionnaire. *Lieu:* L'étude a été menée dans un hôpital universitaire. *Sujet:* Douze femmes qui avaient subi la confection d'une poche iléo-anales dans le centre des maladies inflammatoires du Mount Sinai Hospital et qui par la suite étaient devenues enceintes ont été identifiées à partir des documents de l'hôpital. Un questionnaire de suivi a été complété par tous les sujets. *Résultats:* Douze patientes ont mené à terme 16 grossesses qui se sont terminées par 10 accouchements et 6 césariennes. Aucune complication n'est à déplorer en relation avec la poche au cours des 16 grossesses et deux complications sont survenues dans les suites des accouchements. *Conclusion:* Une grossesse peut être menée à terme de manière sûre chez des femmes porteuses d'une poche iléo-anales. Des résultats fonctionnels sont altérés au min-

imum. L'accouchement est sûr et seules des raisons obstétricales doivent être envisagées pour réaliser une césarienne.

Ileal pouch-anal anastomosis (IPAA) is a well established alternative to proctocolectomy and ileostomy, Kock pouch or colectomy with ileorectal anastomosis in the surgical management of chronic ulcerative colitis (CUC) or familial adenomatous polyposis (FAP). Women with these diseases are often diagnosed and operated upon while young and in their reproductive years. Fertility in the patients with UC appears to be normal [1], and with the exception of those who have severe disease during pregnancy, the incidence of spontaneous abortion appears to approximate that of the general population [2]. It is now known that women with active disease may deliver healthy children provided their disease is treated appropriately. It is recognised that the risk of fetal death is increased in patients requiring surgery for toxic megacolon or fulminant colitis during pregnancy during the third trimester [3].

Patients who have undergone either a Kock pouch or proctocolectomy and ileostomy may have a normal pregnancy and childbirth [4]. However complications such as intestinal obstruction occur when a stoma is in place. Gopal et al. [5] found in a series of 82 pregnancies in 66 women with ostomies of whom 64% had undergone a proctocolectomy with ileostomy for CUC, that 29% of the pregnancies were complicated by stoma complications. In a series of Kock pouches a high rate of pouch-related symptoms during the pregnancy was found [4].

Most patients with IPAA return to a normal lifestyle and some wish to bear children. The first report of a successful pregnancy and delivery was over 10 years ago, in 1984 [6], where it was recommended that caesarian section delivery should be performed. The literature on IPAA and pregnancy and gynaecological function is scarce [7–10], and 3 of the publications (from one cohort of patients) are from the same institution [7–9]. It has been shown that women who have had an IPAA can have a safe

pregnancy and delivery with minimal effect on post partum pouch function, although this may be altered during the pregnancy [9].

The patients who have become pregnant and have delivered with IPAA's at our unit have been reviewed. The obstetric history prior to the colectomy, method of delivery, pouch function and outcome are described.

## Materials and methods

At the Inflammatory Bowel Disease Centre of Mount Sinai Hospital 735 IPAA's have been performed between 1982–1994. There were 330 women, average age 29 (range 14–69). From the IPAA registry and hospital records, 12 patients have been identified who have had at least one pregnancy and delivery following surgery. The charts of these patients were reviewed and a follow up questionnaire was completed. Specific questions concerned the fertility before the colectomy, pregnancies, the type of delivery before and after the pouch operation, the length of labour, the need for episiotomy and the birth weight. Pouch function before, during and post partum has been evaluated with questions on stool frequency and incontinence during the day and night, consistency of stool, pad usage and skin irritation. As in other studies [8, 9] frequent incontinence was defined as occurring at least once a week during the day or twice during the night. Mild incontinence was defined as rare seepage not requiring a pad and not interfering with daily activities. Stool consistency was defined as liquid, semiliquid, or solid.

Of 12 patients, 10 had a stapled J pouch and 2 had an S pouch. Three patients, one with a J and two with S pouches, had polyposis. The remaining patients had ulcerative colitis. Two patients underwent IPAA without a covering loop ileostomy. There have been a total of 16 deliveries after IPAA; one in nine, two in two and three in one patient. Maternal age for the first pregnancy varied from 22–34 (median 32) years. The median follow-up from the date of the most recent delivery was 33 (range 5–125) months. The median interval between closure of the ileostomy or the IPAA and delivery was 32 (range 17–68) months.

Statistical analysis used the Wilcoxon rank test.

## Results

Five women (42%) had previously each delivered 1 child vaginally before their colectomies. The median time of delivery prior to the colectomy was 3.1 (range 1–5) years. One woman had undergone a vaginal termination of pregnancy 8 years before colectomy. One woman unsuccessfully attempted to become pregnant for 2 years prior to surgery. The other five women denied attempting to become pregnant.

### Pregnancy

There were no pouch related complications during the 16 pregnancies.

### Delivery

The types of delivery and rationale for them are shown in Table 1. All 10 vaginal deliveries were term, 6 required an episiotomy and two of these had forceps-assisted delivery. The median time in labour was 12 (range 1–22) hours.

**Table 1.** The table demonstrates the types of delivery and the reasons the route of delivery was chosen

Types of delivery	Rationale	Patient number
Vaginal (10)	Patient preference	6
	Surgeon advised	1
	Obstetrician advised	3
Caesarian section (6)	Obstetrician advised	3
	Pre-eclampsia	1
	Breech presentation	1
	Abruptio placentae	1

All babies were born alive, but one died with 10 minutes of delivery due to an E. Coli septicaemia. The median birthweight was 3.23 (range 3.0–3.64) kilograms.

The median birthweight of the babies delivered by caesarian section was 3.3 (1.1–4.3) kilograms.

Three women in this series had multiple deliveries; two had two uncomplicated vaginal deliveries and one delivered the baby who died of the E. Coli septicaemia at her second vaginal delivery. Her third delivery was via caesarian section, following obstetric advice.

### Pouch function

There were 8.1 (4–24) evacuation per 24 hours during pregnancy and 6.5 (4–11) per 24 hours 6 months postpartum. There was no statistical difference ( $P>0.5$ ) between any of these episodes. Five women had no change in pouch function during the pregnancy, and one woman had decreased pouch emptying while she was pregnant.

One woman experienced diarrhoea causing up to 24 evacuation per day and maternal weight loss towards the end of the pregnancy. Clostridium difficile was cultured from the stools and she was treated with a 14 day course of Vancomycin.

One woman had frequent incontinence and perianal irritation, and two complained of mild incontinence. Two other women noted an increase in night-time frequency and had to wear a pad. Two women noted their stool consistently change to semiliquid in their last trimester.

### Postpartum complications

Two women experienced postpartum complications. One whose obstetrician advised her to have a vaginal delivery underwent a vaginal delivery with an episiotomy and forceps. The birthweight was 1.76 kilogrammes. Prior to pregnancy she was completely continent. Four years postpartum she is experiencing occasional seepage and nocturnal incontinence once a week.

One woman underwent an uncomplicated caesarian section on obstetric advice. Twenty-four hours post delivery she developed a small bowel obstruction. This settled over 7 days with conservative management, and the patient has been symptom free for the last 33 months.

## Discussion

Ileal pouch-anal anastomosis is now recognized as the operation of choice at our centre for patients with CUC and FAP. There is a rapid return to normal lifestyle and activities with an ileal pouch-anal restorative proctocolectomy [11].

The number of women who have become pregnant in this series (12) is less than the Mayo Clinic's series (43), but the pouch-related complication rate is similar. This is further evidence that patients with an IPAA have a lower pouch complication rate than the stoma-related complication rates reported for pregnant patients with a conventional ileostomy (29% complication rate) [5]. In these surgical intervention during pregnancy was required in 9% of cases. Kock pouch patients were reported to have a 53% complication rate during pregnancy [4] and 19% required revisionary surgery of the nipple valve after pregnancy was completed. In our series no patients have required surgery, and there have been only 2 (13%) postpartum complications, one of which has resulted in the nocturnal wearing of a pad.

It is apparent that pregnant patients who have undergone either a proctocolectomy and ileostomy, Kock pouch [4, 5] or IPAA are likely to have a normal pregnancy and delivery but those with an IPAA are less likely to require surgery during or after the pregnancy for pouch related complications [8]. It appears that the complications experienced by pregnant patients with a conventional ileostomy or Kock pouch are related to compression of the stoma or the Kock pouch by the expanding uterus. Despite that fact that the ileonal pouch is behind the uterus and deep in the pelvis where it may be compressed (along with the urinary bladder) in pregnancy, we have not found a statistically significant overall increase in frequency of pouch emptying during pregnancy. This is in keeping with other reports [8] Nelson et al. [8] reported an increase in nocturnal stooling. A subsequent Mayo report of 43 women also found that incontinence and pad usage were significantly increased during pregnancy [9], and that prepregnant function was restored after delivery. In our own series there was an increase in nocturnal incontinence in 3 of the 12 women.

Only one woman experienced infertility before surgery, but she became pregnant 6 months after the closure of her ileostomy. It has been reported that women experience enhanced sexual function, following proctocolectomy for benign disease [12]. This has been attributed to improved health. Sexual problems are reported to be increased in patients after an IPAA; the incidence of dyspareunia was increased by 10% and the incidence of faecal incontinence during intercourse was increased by 4% in a series of 203 women following surgery [10].

The effects of IPAA on fertility are unknown. It has been shown in surveys of women of childbearing age with ulcerative colitis that the disease does to substantially alter fertility [1], and that, as in the general population, 80% to 90% of women are able to become pregnant [13]. It has been suggested that fertility is unaffected in IPAA women [7, 11]. However pelvic surgery; – whether it be proctocolectomy and ileostomy, Kock pouch or IPAA, in certain

individuals will result in the formation of adhesions and thereby may alter fertility. It is not known what proportion of women of childbearing age who have had pelvic surgery are affected this way. Counihan [10] defined infertility as the inability to conceive one year after unprotected sexual intercourse. He found that 9% of women were infertile after IPAA whereas 2% of women had reported infertility before surgery.

We confirm previous reports in the literature [6–10] that childbirth is safe and that problems associated with the pelvic pouch are relatively uncommon. The optimal route of delivery remains undetermined, as there are advantages and disadvantages with each mode of delivery. Caesarian section has been recommended [6–10], especially when there is rigidity and poor compliance of a scarred perineum. It decreases the risk of incontinence and potential damage to the anal sphincters and to the pelvic pouch but is associated with all the complications of abdominal surgery including formation of adhesions. On the other hand, vaginal delivery can lead to damage of the pudendal nerve and anal sphincter mechanism.

However, vaginal delivery lessens the risk of problems associated with abdominal surgery and recovery is more rapid [10]. A balance must therefore be struck with regard to the recommended mode of delivery. This and other reviews have been unable to show the superiority of one method of delivery. We would, however, suggest that vaginal delivery is safe and that caesarian section should be recommended for obstetric indications.

## Conclusions

This small retrospective study supports the findings of others [9, 10] that women with IPAA's have a relatively normal pregnancy with only mild disturbance of pouch function. The effect of IPAA on fertility is unknown and probably has the same effect as other forms of pelvic surgery. As the incidence of IPAA's increases, so will the number of women who conceive and deliver with a pelvic pouch. At present there is no evidence to suggest one particular route of childbirth is superior. The patient's views along with those of the attending obstetrician and surgeon should be considered before the type of delivery is elected.

## References

1. Donaldson RM (1985) Management problems in pregnancy – inflammatory bowel disease. *N Engl J Med* 312: 1616–1619
2. Baynes CS, Hayes HM (1931) Ulcerative colitis complicating pregnancy and the puerperium. *Am J Obstet Gynecol* 22: 907–912
3. Anderson JB, Turner GM, Williamson RCN (1987) Fulminant ulcerative colitis in late pregnancy and the puerperium. *J R Soc Med* 80: 492–494
4. Ojerskog B, Kock NG, Philipson BM, Philipson M (1988) Pregnancy and delivery in patients with a continent ileostomy. *Surg Gynecol Obstet* 167: 61–64
5. Gopal KA, Amshel AL, Shonberg IL, Levinson BA et al (1985) Ostomy and pregnancy. *Dis Colon rectum* 28: 912–916
6. Pezim ME (1984) Successful childbirth after restorative proctocolectomy with pelvic ileal reservoir. *Br J Surg* 71: 292

7. Metcalf A, Dozois RR, Beart RW, Wolff BG et al (1985) Pregnancy following ileal pouch-anal anastomosis. *Dis Colon Rectum* 28: 859–861
8. Nelson H, Dozois RR, Kelly KA, Malkasian GD et al (1989) The effect of pregnancy and delivery on the ileal pouch-anal anastomosis functions. *Dis Colon Rectum* 32: 384–388
9. Juhasz ES, Fozard B, Dozois RR, Ilstrup DM, Nelson H (1995) Ileal pouch-anal anastomosis function following childbirth. *Dis Colon Rectum* 38: 159–165
10. Counihan TC, Roberts PL, Schoetz DJ, Collier JA, et al (1994) Fertility and sexual and gynecologic function after ileal pouch anal anastomosis. *Dis Colon Rectum* 37: 1126–1129
11. Pemberton JH, Phillips SF, Ready RR, Zinmeister AR, Bearhs OH (1989) Quality of life after Brooke ileostomy and ileal pouch-anal anastomosis: comparison of performance status. *Ann Surg* 209: 620–626
12. Metcalf AM, Dozois RR, Kelly KA (1986) Sexual function in women after proctocolectomy. *Ann Surg* 204: 624–627
13. Willoughby CP, Truelove SC (1980) Ulcerative colitis and pregnancy. *Gut* 21: 469–474