

---

# Salvage Surgery After Restorative Proctocolectomy

Francesco Selvaggi, Guido Sciaudone, Antonio Giuliani, Crescenzo Di Stazio, Ilaria Guadagni

---

## Introduction

The failure rate of restorative proctocolectomy (RP) varies from 5 to 15% of the cases [1, 2], but with the lengthening of follow-up, the rate exceeds 15% [3]. Failure of the RP refers to the necessity of fashioning a loop ileostomy with the pouch in site or the removal of the pouch with definitive ileostomy. The causes of failure include acute and chronic sepsis, bad functioning in regard to mechanical and functional causes and mucosal inflammatory processes. Procedures for avoiding loss of anal function come within the scope of salvage surgery.

---

## Sepsis

Sepsis can be defined early or late. The incidence of such complications varies in 5–25% of cases after RPs [4, 5], and approximately half of these are responsible for the failure of the surgical operation. The majority of the cases depend on the anastomotic complications regarding the pouch anal or regarding the proximal ileum to the pouch. After modification via mucosectomy's technique, which is used preliminarily to remove all disease (prone mucosa), the sepsis rate is remarkably reduced. The experience of the surgeon in transanal surgery is the factor that can meaningfully influence any complications [3, 6, 7].

Early sepsis manifests itself as fever, tenesmus and loss of pus through the anus. In a certain number of cases, antibiotic therapy can resolve the infection. In others, however, TC-guided transanal or transabdominal drainage is necessary. In some cases, it is sufficient to open the pouch-anal anastomosis in order to guarantee adequate transanal drainage. In severe sepsis, laparotomic access is mandatory; it is in these cases that the removal of the pouch from its natural site is frequently carried out, whereas the closing of the ileostomy is done infrequently.

In the experience of Heuschen [8] with 131 patients with sepsis, approximately 16% of these

could be treated conservatively. Failure was in relation to the procedure carried out. In fact, it occurred in 6% of the cases after minimal surgery and in 47% of the cases after major surgery. Consequently, it is obvious that premature sepsis represents an important risk factor regarding the success or failure of the procedure.

Late sepsis generally manifests itself with the appearance of abdominal or pelvic abscesses and/or with formation of fistulas. In the case of circumscribed sepsis, surgical or TC-guided drainage can resolve the inflammatory process, otherwise pouch salvage surgery, with the removal of the pouch from the pelvis and the positioning of it under the abdominal wall along with the creation of a mucosal fistula, can represent an adequate therapeutic choice. This procedure was successful in five patients of eight in the study of Keighley [9] and in two of four in the study of the Mayo Clinic Group [10].

In Fazio's study [11] of 35 patients with sepsis, of which 29 had leakage of the ileo-anal anastomosis, the patients were treated via abdominal surgery. The rescue of the pouch was achieved in 21 out of 22 patients with ulcerative colitis, preserving transanal evacuation to the detriment of the bowel function, which was characterised by an evacuative frequency of 9 motions within 24 h, (ranging between 4 and 35 motions). The quality of life (QoL) was good in 17 patients and bad in 13.

Cohen [12] performed salvage surgery on 24 patients and obtained acceptable results for 20. In 18 of these, the medium frequency of elimination was 5 evacuations/day and 1.5 nocturnally, with good continence in 13 of the patients. Galandiuk [13] operated for intra-abdominal sepsis on 29 patients and reported 17 failures, which emphasises that the possibility for failure increases with time.

Heuschen [8] reports 131 patients with sepsis on 706 PR. In the experience of the author, early sepsis involves a greater risk of failure that increases with time at a rate of 20% at 3 years and 40% at 10 years. The site of the fistula is proximal to the pouch in 13% of cases, at the level of the neorectal cuff in 31% and

at the level of the ileo-anal anastomosis in 50% of cases. Treatment has been conservative in 18% of cases, with transanal surgery in 25% of cases and abdominal in 56% of cases. The difference in the failure is higher after major surgery (45%) than minor surgery (5%). The failure was also correlated to the dehiscence of the pouch-anal anastomosis and to the presence of a pouch-vaginal fistula. Experiences up to now demonstrate a great variability of results in relation to the severity of sepsis, the site regarding the pouch-anal anastomosis and to the duration of the follow-up.

Gorfine [14] of Mount Sinai in New York reports on 1 185 RPs: 51 patients with sepsis from leakage of the pouch-anal anastomosis in which 85 surgical procedures were carried out including 48 transanal surgeries in patients without ileostomy, 37 transanal surgeries in patients with ileostomy and 4 abdominal and perineal operations in patients with ileostomy. In 40% of patients he obtained a good result at a medium follow-up of 65 months. Comparing patients with and without ileostomy who received a surgical transanal procedure, the author did not see any evidence of differences in results. Moreover, he reports on the failure in all patients who had abdominal surgery. The author concludes, that in order to obtain good results, more surgical procedures are necessary, so that there are no differences between patients with and without ileostomy, which emphasises the failure of abdominal procedures used in the attempt to rescue the pouch.

Dehni [15] reported on the experience acquired from 54 patients who underwent salvage surgery, of which 47 had sepsis. In 19 patients with cases of abscess, he utilised a transanal approach preceded by surgical or radiological transanastomotic or perineal drainage. In the remaining cases he preferred an abdominoperineal approach. Altogether, 27 of the 40 patients evaluated after abdominoperineal surgery and 13 of the 18 after transanal surgery, obtained satisfactory results. Of the patients operated on for sepsis, 44 at a medium follow-up of 30 months obtained good results. Crohn's disease was subsequently diagnosed in three patients out of four who had pouch failure after salvage surgery.

### Pouch-Vaginal Fistula

The symptoms of pouch-vaginal fistula consist of leakage of secretion or gas from the mucosa and/or faecal leakage through the vagina or the perineum. Its incidence is equal to approximately 5–10% of patients operated on for RP. The treatment depends on the severity of the symptoms. In the case of minimal symptoms, the application of a seton tie could be

sufficient, even if long-term data on it does not exist [16].

In the case of incontinence, a defunctioning ileostomy can be performed and a seton tie can be inserted for drainage. Once the sepsis has been resolved, recanalisation will be possible. The insertion of a seton tie is probably the technique of choice in the presence of a cryptoglandular fistula. Ileostomy alone, in fact, is not in a position to guarantee satisfactory results [17].

Surgical procedures can be divided into abdominal and local. The first is concerned with abdominal revision and the advancement of the ileo-anal anastomosis. Local procedures, on the other hand, such as advancement flap repair and endoanal or endovaginal repair, precede fistulectomy.

It is obvious that the site of anastomosis influences surgical choice. According to some authors, in the presence of anastomosis in the distal rectum, it is possible to make a reconstruction and to perform a more distal anastomosis with success in 21 out of 26 patients [12, 16, 17]. In the case of a fistula that is derived from ileo-anal anastomosis, a local treatment is recommended.

Advancement flap repair determines success in 50% of cases. Transvaginal repair allows a direct access to the fistula avoiding sphincter damage. In one study, five patients out of seven obtained good results at a mean follow-up of 26 months [13]. Others authors have reported good results in 11 patients out of 14 at a mean follow-up of 18 months [18].

In reviewing the various results obtained with a transvaginal approach, the closing of the fistula has been demonstrated in 25 patients out of 35. Surgery with an abdominal approach is in a position to achieve good results in 80% of cases; with the perineal approach the percentage falls to 50% of cases [13, 16, 19, 20].

A further condition that can lead to the removal of the ileal pouch is represented via malfunction. Such an event is responsible for 20–40% of failure of the pouch [9, 10]. Karoui [21] reports a removal rate of 35% for poor functioning (24 out of 58 removals) due to outlet obstruction in 10 patients and incontinence in 14 patients. The success rate after medical or surgical treatment is extremely variable in the literature, ranging between 33 and 100% of cases [9, 22]. Surgical treatment can consist of an exclusively transanal approach or a combined abdominoperineal approach, depending on the reason of dysfunction and technical feasibility [23]. The most frequent causes of malfunction are represented by mechanical obstruction, sphincter dysfunction, reduced capacity of the reservoir or by mucosal inflammation [24]. The majority of the patients with poor functioning have an evacuation frequency of 10 motions/24 h or

more, often associated with emission of small volumes of faeces and the presence of urgency, incontinence and evacuation difficulties [24].

Outlet obstruction (OO), which alone is responsible for 18–48% of the malfunction of the ileal reservoir [9, 10], can be determined by various factors including stenosis of the pouch-anal anastomosis, a long efferent limb (LEL) in an S-shaped form or by the presence of a residual of rectal mucosa at the level of the pouch-anal anastomosis (retained rectal stump).

### Stenosis of Pouch-Anal Anastomosis

Ogunbiyi's study [9] on 198 PRs reports nine cases of OO due to stenosis of the pouch-anal anastomosis in four, LEL in two, prolapse of the pouch in one and stenosis of the remaining ileum above the pouch in two cases. All patients with stenosis of the pouch-anal anastomosis underwent a reconstruction of the reservoir with success in three patients out of four. A pouchpexy was performed with success in the patient with prolapse of the pouch. In the two patients with LEL, the efferent limb was successfully removed. In the two cases of stenosis above the pouch, one patient showed no improvement of clinical conditions after the construction of a pouch-anal anastomosis L/L, while for the other patient who was diagnosed with Crohn's disease after the construction of the reservoir, the resulting strictureplasty was successful.

A stenosis of the pouch-anal anastomosis, requiring a single dilatation, is described in the literature in a variable percentage from 4–40% of cases [1, 13, 25–31]. This event is more frequent in patients with UC [13, 28, 29] compared to those with FAP and shows a double incidence regarding mechanical anastomosis compared to those made by hand [29]. Senapati [31] in a study of 266 patients who underwent PR, reported stenosis in 14.2 and 39% of the patients, depending on whether the procedure had been carried out via manual or mechanical anastomosis. The first therapeutic approach to stenosis of the pouch-anal anastomosis, is dilatation under anaesthesia. With this procedure Senapati [31] reports a success rate of 26%, while Galandiuk [13] at a 31-month follow-up (range 1–98) reports a relapse rate of 59% with failure in 16% of the cases. The same author reports satisfactory results after repeated dilatations in more than 50% of cases (23 patients out of 42). In particular, in the case of a short stenosis, a posterior strictureplasty can be indicated. Stenosis of 2 cm of length can be corrected by an exclusive transanal approach. In the case of a long stenotic segment, on the other hand, a combined abdominoperineal approach is recommended [32, 33].

According to Dehni's [23] study of 23 patients who underwent transanal surgery, 4 because of fibrous stricture, the combined abdominoperineal conversion is mandatory. The transanal approach with removal of the stenosis and distal advancement of the pouch is particularly indicated in cases with concomitant vaginal fistula [32].

The remaining therapeutic options consist of the removal of the pouch with definitive ileostomy, which was necessary in 2.5–15% of the cases, or by abdominal salvage surgery, with removal of the pouch, removal of the fibrotic ring and reconstruction of the pouch-anal anastomosis restoring the proximal portion of pouch [24].

Maclea [34] of the Mount Sinai Hospital of Toronto, comparing patients who underwent rescue of the pouch through an abdominal approach in cases of pelvic sepsis or OO, reported a minor incidence of complications (33.3 vs. 61.5%,  $p=0.047$ ) in patients with OO. This emphasises, moreover, that there was a greater risk of malfunction in those cases where it was necessary to refashion a new pouch then where it was possible to modify the old reservoir, depending on whether there was insufficient compliance due to fibrosis and a reservoir lacking in volume with a subsequent increase of evacuation frequency.

### Long Efferent Limb

Parks and Nicholls's S-pouch [35] or Fonkalsrud's H-pouch [22] can determine the formation of an efferent limb of the terminal ileum, which constitutes the proximal side of ileo-anal anastomosis. A long efferent limb (LEL), >8 cm of length, fashioned in the first "debut" cases of the S-reservoir, needed catheterisation of the pouch to achieve evacuation in more than 50% of the patients [36].

Fonkalsrud [22], in his study of 601 PRs, reports an OO rate of 27.3%, with a success rate after surgical review in 93% of cases. In this experience, however, 221 patients had an H-reservoir and 4 had an S-reservoir constructed in the early 1980s. Those made at that time were abandoned because of an elevated incidence of emptying with the necessity of catheterisation.

The removal of the LEL is possible through a transanal approach, but it is technically feasible in less than 30% of patients [22, 37]. The technique consists of mobilisation of the pouch and separation of the ileo-anal anastomosis. The efferent limb is removed and a new manual anastomosis is fashioned between the pouch and the anal canal.

Sagar [10], in a study of 1 770 ileal pouches, evidenced 9 LELs (5–11 cm), all of which were in patients with an S-pouch, and 3 blind handle torsions

in patients with J-pouches. After surgical treatment of the nine patients with LEL, five demanded construction of a new reservoir, which was successful in seven cases (78%). In the three patients with blind handle torsions, he did not fashion a new reservoir and only one patient benefited from the surgical treatment. Of a total of 26 patients who underwent this treatment, failure of the surgical procedure was recorded in 5, while 18 showed improvement which included a change from needing catheterisation to spontaneous evacuation [9, 10, 37, 38].

### Retained Rectal Stump

The use of stapling in the realisation of the pouch-anal anastomosis or the insufficient execution of mucosectomy are the main causes of retention of rectal mucosa. In fact, with the double stapling technique, a little stump of rectal mucosa of variable length from 1.5–3 cm, in which the disease persists, is left *In Situ*. A certain degree of inflammation is commonly found on the biopsies carried out on the residual cuff of the columnar epithelium. However, this only causes symptoms in 2–15% of patients [39–42].

According to the experience of Herbst [38] in a study of 16 PRs with OO, in half of the patients, the functional disturbance was associated with an LEL of the S-pouch, five were associated with a stenosis of the pouch-anal anastomosis, and one was associated with a stenosis associated to an LEL, while two were associated with a long rectal stump. None of the patients had the reservoir reconstructed during a subsequent operation and surgery was successful in 80% of cases. The author concludes that with the use of a mechanical pouch-anal anastomosis, the incidence of a long rectal stump increases because of OO [38].

Lavery of the Cleveland Clinic, in one study focussing on 227 patients with PR, reports the presence of inflammation of the cuff, histologically demonstrated, in 82% of cases. This condition generated a clinical symptomatology in only 14.7% of the patients. The more frequent disturbances during cuffitis are bleeding, burning and urgency; moreover, neoplastic transformation of the residual rectal mucosa is possible [39, 40, 43]. Local treatment with steroids can determine remission of symptoms, but often definitive resolution of clinical presentation is possible only with surgical therapy.

Five patients of the series of Dehni [23] received a salvage procedure of the pouch for complications due to a long rectal stump with the presence of severe cuffitis in two cases, difficulty of emptying in two others and development of carcinoma on the stump in one case. Four of these patients demanded a new

anastomosis carried out via a transanal approach and one demanded a review via an abdominalperineal approach.

If the retained portion of mucosa is short, a transanal approach can be possible, but in the majority of the cases, a combined abdominoperineal approach, that includes removal of the residual rectum followed by manual mucosectomy and transanal refashioning of the pouch-anal anastomosis is necessary.

Curran [42] reports three cases where there was a necessity to carry out a transanal mucosectomy for resolution of the symptomatology. In one of these cases the removal of the pouch was necessary. Fazio obtained good results associating the advance of the reservoir to a transanal [44].

### Small Volume Reservoir

The first type of reconstruction after total proctocolectomy was the straight ileo-anal anastomosis. The unsatisfactory results of such a procedure together with the studies of Nicholls [45], which demonstrated the presence of an inverse relation between evacuation frequency and reservoir capacity, determined the spread of the pelvic pouches. However, constructing a pouch so as to have satisfactory functional results is not sufficient, because an adequate volume of the reservoir is necessary for the functioning of the neo-rectum with a reduction of evacuation frequency. In fact, insufficient volume of the reservoir can be responsible for the elevated number of evacuations and urgency. The demonstration of the importance of an adequate volume is represented in the differences in the results that can be observed between the J and the W-pouch [46].

The pouch enema and above all the mano-volumentry along with the determination of the threshold volume (TV) and the maximum tolerated volume (MTV) can define the capacity and compliance of the reservoir exactly. Medical therapy (loperamide, codeine and mass-forming drugs), often is not able to improve the evacuation frequency, so therefore, an abdominal operation becomes necessary in order to enlarge the pouch. Herbst demonstrated a meaningful reduction of evacuation frequency using this method [38] and Fazio [11] used this method in 7 of 35 patients reoperated on for sepsis.

Klas [47] reported that in five cases of insufficient volume of the reservoir for which he carried out a conversion from a J to a W pouch, daily evacuation frequency had been reduced, with much satisfaction on behalf of the patients, from 13–8 to 5–8 and the nocturnal episodes from 3–0 to 0–3. However, such an increase of the pouch, which certainly represents

a more conservative method than *ex novo* construction of the reservoir, is not always feasible. This technique consists of the addition of a small intestinal loop to the proximal part of the pouch without removing it from its site, or as an alternative, mobilisation of the reservoir, modification of the J-pouch in order to construct a W-reservoir and finally a reconstruction of the pouch-anal anastomosis. In the case of a J-pouch with a long blind stump, its integration with an L/L suture is sufficient for increasing the volume of the pouch.

## References

1. Marcello PW, Roberts PL, Schoetz DJ Jr et al (1993) Long-term results of the ileoanal pouch procedure. *Arch Surg* 128:500–503
2. Fiandra JFV (1993) The ileal pouch: indications for its use and results in clinical practice. *Curr Pract Gastroenterol* 4:22–28
3. Meagher AP, Farouk R, Dozois RR et al (1998) J ileal pouch-anal anastomosis for chronic ulcerative colitis: complications and long-term outcome in 1310 patients. *Br J Surg* 85:800–803
4. Pemberton JH, Kelly KA, Beart RW Jr et al (1987) Ideal pouch-anal anastomosis for chronic ulcerative colitis: long-term results. *Ann Surg* 206:504–513
5. Mc Mullen K, Hicks TC, Ray JE et al (1991) Complications associated with ileal pouch-anal anastomosis. *World J Surg* 15:763–766
6. Scott NA, Dozois RR, Beart RW Jr et al (1988) Postoperative intra-abdominal and pelvic sepsis complicating ileal pouch-anal anastomosis. *Int J Colorectal Dis* 3:149–152
7. Keighley MR, Grobler S, Bain I (1993) An audit of restorative proctocolectomy. *Gut* 34:680–684
8. Heuschen UA, Allemeyer EH, Hintz U (2002) Outcome after septic complications in J pouch procedures. *Br J Surg* 89:194–200
9. Ogunbiyi OA, Korsgen S, Keighley MR et al (1997) Pouch salvage long-term outcome. *Dis Colon Rectum* 40:548–552
10. Sagar PM, Dozois RR, Wolff BG, Kelly KA (1996) Disconnection, pouch revision and reconnection of the ileal pouch-anal anastomosis. *Br J Surg* 83:1401–1405
11. Fazio VW, Wu JS, Lavery IC (1998) Repeat ileal pouch-anal anastomosis to salvage septic complications of pelvic pouches: clinical outcome and quality of life assessment. *Ann Surg* 228:588–597
12. Cohen Z, Smith D, McLeod R (1998) Reconstructive surgery for pelvic pouches. *World J Surg* 22:342–346
13. Galandiuk S, Scott NA, Dozois RR et al (1990) Ileal pouch anal anastomosis: reoperation for pouch related complications. *Ann Surg* 212:446–452; Discussion 452–454
14. Gorfine SR, Fichiera A, Harris MT, Bauer JJ (2003) Long-term results of salvage surgery for septic complications after restorative proctocolectomy: does fecal diversion improve outcome? *Dis Colon Rectum* 46(10):1339–1344
15. Dehni N, Cunningham C, Parc R (1998) Use of jejunal pouch with ileal interposition in salvage surgery after restorative proctocolectomy. *Dis Colon Rectum* 41:1587–1589
16. Keighley MR, Grobler SP (1993) Fistula complicating restorative proctocolectomy. *Br J Surg* 80:1065–1067
17. Paye F, Penna C, Chiche L et al (1996) Pouch-related fistula following restorative proctocolectomy. *Br J Surg* 83:1574–1577
18. Burke D, van Laarhoven CJ, Herbst F, Nicholls RJ (2001) Transvaginal repair of pouch-vaginal fistula. *Br J Surg* 88:241–245
19. Groom JS, Nicholls RJ, Hawley PR, Phillips RK (1993) Pouch-vaginal fistula. *Br J Surg* 80:936–940
20. Wexner SD, Rothenberger DA, Jensen L et al (1989) Ileal pouch vaginal fistulas: incidence, etiology, and management. *Dis Colon Rectum* 32:460–465
21. Karoui M, Cohen R, Nicholls J (2004) Results of surgical removal of the pouch after failed restorative proctocolectomy. *Dis Colon Rectum* 47:869–875
22. Fonkalsrud EW, Bustorff-Silva J (1999) Reconstruction for chronic dysfunction of ileo-anal pouches. *Ann Surg* 229:197–204
23. Dehni N, Remacle G, Dozois RR et al (2005) Salvage reoperation for complications after ileal pouch anal anastomosis. *Br J Surg* 92:748–753
24. Tulchinsky H, Cohen CRG, Nicholls RJ (2003) Salvage surgery after restorative proctocolectomy. *Br J Surg* 90:909–921
25. Metcalf AM, Dozois RR, Kelly KA et al (1985) Ileal “J” pouch-anal anastomosis: clinical outcome. *Ann Surg* 202:735–739
26. Fleshmann JW, Cohen Z, McLeod RS et al (1988) The ileal reservoir and ileo-anal anastomosis procedure: factors affecting technical and functional outcome. *Dis Colon Rectum* 31:10–16
27. Breen EM, Schoetz DJ Jr, Marcello PW et al (1998) Functional results after perineal complications of ileal pouch anal anastomosis. *Dis Colon Rectum* 41:691–695
28. Schoetz DJ Jr, Coller JA, Veidenheimer MC (1988) Can the pouch be saved? *Dis Colon Rectum* 31:671–675
29. Lewis WJ, Kuzu A, Sagar PM (1994) Stricture at the pouch-anal anastomosis after restorative proctocolectomy. *Dis Colon Rectum* 37:120–125
30. Beart RW Jr (1986) Proctocolectomy and ileo-anal anastomosis with a J-pouch. *Aust N Z J Surg* 56:467–469
31. Senapati A, Tibbs CJ, Ritchie JK (1996) Stenosis of the pouch-anal anastomosis following restorative proctocolectomy. *In J Colorect Dis* 11:57–59
32. Fazio VW, Tjandra JJ (1992) Pouch advancement and neoleal anastomosis for anastomotic stricture and anovaginal fistula complicating restorative proctocolectomy. *Br J Surg* 79:694–696
33. Prudhomme M, Dozois RR, Goldlewinski G et al (2003) Anal canal strictures after ileal pouch-anal anastomosis. *Dis Colon Rectum* 46:20–23
34. MacLean AR, O’Connor B, Parkes R, et al (2002) Reconstructive surgery for failed ileal pouch-anal anastomosis: a viable surgical option with acceptable results. *Dis Colon Rectum* 45(7):880–886
35. Parks AG, Nicholls RJ (1978) Proctocolectomy without ileostomy for ulcerative colitis. *BMJ* 2:85–88
36. Pescatori M, Manhire A, Bartram CI (1983) Evacuation

- pouchography in the evaluation of ileo-anal reservoir function. *Dis Colon Rectum* 26:365-368
37. Nicholls RJ, Gilbert JM (1990) Surgical correction of the efferent ileal limb for disordered defaecation following restorative proctocolectomy with the S-ileal reservoir. *Br J Surg* 77:152-154
  38. Herbst F, Sielezeneff I, Nicholls RJ (1996) Salvage surgery for ileal pouch outlet obstruction. *Br J Surg* 83:368-371
  39. Avery IC, Sirimarco MT, Fazio VW (1995) Anal canal inflammation after ileal pouch-anal anastomosis: the need for treatment. *Dis Colon Rectum* 38:803-806
  40. Thompson-Fawcett MW, Mortensen NJ, Warren BF (1999) Cuffitis' and inflammatory changes in the columnar cuff, anal transitional zone, and ileal reservoir after stapled pouch-anal anastomosis. *Dis Colon Rectum* 42:348-355
  41. Schmitt SJ, Wexner SD, Lucas FV et al (1992) Retained mucosa after double-stapled ileal reservoir and ileoanal anastomosis. *Dis Colon Rectum* 35:1051-1056
  42. Curran FT, Hill GI (1992) Symptomatic colitis in the anal after restorative proctocolectomy. *Aus N Z Surg* 62:941-943
  43. Rotholtz NA, Pikarsky AJ, Singh JJ, Wexner SD (2001) Adenocarcinoma arising from along the rectal stump after double-stapled ileorectal J-pouch in a patient with ulcerative colitis: the need to perform a distal anastomosis. Report of a case. *Dis Colon Rectum* 44:1214-1217
  44. Fazio VW, Tjandra JJ (1994) Transanal mucosectomy, ileal pouch advancement for anorectal dysplasia or inflammation after restorative proctocolectomy. *Dis Colon Rectum* 37:1008-1011
  45. Nicholls RJ, Pezim ME (1985) Restorative proctocolectomy with ileal pouch reservoir for ulcerative colitis and familial adenomatous polyposis: a comparison of three reservoir designs. *Br J Surg* 72:470-474
  46. Selvaggi F, Giuliani A, Gallo C et al (2000) A randomized controlled trial to compare the J and W pouch configurations for ulcerative colitis in the maturation period. *Dis Colon Rectum* 43:615-620
  47. Klas J, Myers GA, Starling JR, Harms BA (1998) Physiologic evaluation and surgical management of failed ileoanal pouch. *Dis Colon Rectum* 41:854-861