INTESTINAL POUCH COMPLICATIONS IN PATIENTS WHO UNDERWENT RESTORATIVE PROCTOCOELECTOMY FOR ULCERATIVE COLITIS AND FAMILIAL ADENOMATOUS POLYPOSIS IN 1985-2008

ROBERT BURDYŃSKI, TOMASZ BANASIEWICZ, RYSZARD MARCINIAK, MACIEJ BICZYSKO, JACEK SZMEJA, JACEK PASZKOWSKI, MARCIN GROCHOWALSKI, JAKUB MAIK, PRZEMYSŁAW MAJEWSKI, PIOTR KROKOWICZ, Michał DREW

Department of General and Colorectal Surgery, Medical University in Poznań
Kierownik: dr hab. P. Krokowicz, prof. UM

Chair and Department of General, Gastroenterological and Endocrinological Surgery, Medical University in Poznań
Kierownik: prof. dr hab. M. Drew

Department of General and Colorectal Surgery, Medical University in Poznań
Kierownik: prof. dr hab. P. Majewski

Restorative proctocolectomy is considered a surgical treatment of choice in ulcerative colitis (UC) and familial adenomatous polyposis (FAP).

The aim of the study was to evaluate postoperative complications in patients who underwent surgery for familial adenomatous polyposis and ulcerative colitis, on the basis of a retrospective data analysis.

Material and methods. Data of 138 patients after restorative proctocolectomy performed between 1985 and 2008 were collected at routine follow-up visits in 2004-2008. We evaluated the presence of pouchitis, the degree of ileal pouch mucosa atrophy, the presence of ileal pouch mucosal metaplasia, the presence of ileal pouch malignancies, the necessity for diverting ileostomy, the necessity for pouch resection, and severe faecal incontinence.

Results. Complications were observed in 45 (32.4%) patients. Thirty-seven patients developed pouchitis (26.6%). Low-degree dysplasia, severe dysplasia or malignancies were observed in total in 20 patients (14.4%). Six (4.3%) operated patients developed other analysed complications.

Conclusions. The most common complications of restorative proctocolectomy were dysplasia and pouchitis. The most common complication in patients operated for UC was pouchitis. The low observed incidence of intestinal pouchitis may be attributed to the implemented prophylaxis of inflammation. Dysplasia was the most common complication in patients undergoing proctocolectomy for FAP. Due to an increased risk of dysplastic lesions as compared with UC patients, careful endoscopic follow-up examinations are obligatory in this patient group. Other analysed complications were uncommon and were mostly a consequence of chronic pouchitis. Clinical symptoms of pouch-related problems were similar in both analysed groups.

Key words: proctocolectomy, ileal pouch, complications, familial adenomatous polyposis, ulcerative colitis

Restorative proctocolectomy procedures have been performed in Poland since 1985. The first such operations were performed in Poznań, in the General Gastroenterological Surgery of the Medical University in Poznań. Their authors were Prof. Roman Góral and Dr Piotr Krokowicz. Today, restorative proctocolectomy with J-pouch is a common procedure in surgical treatment of ulcerative colitis (UC) and familial adenomatous polyposis (FAP). Restorative proctocolectomy is a procedure associated with good functional outcomes and
satisfactory quality of life (fig. 1). Nevertheless, it involves a risk of a number of early and delayed postoperative complications (1).

The most common complication is the so-called pouchitis. The characteristic albeit unspecified clinical symptoms of pouchitis included abdominal pain, especially with bowel movements, loose stools with admixture of mucus and blood, faecal urgency, elevated body temperature and diarrhoea which may rapidly lead to severe dehydration (2). It is a common view that pouchitis is more common in patients operated for UC than FAP. The incidence of pouchitis is estimated at 23-60% (3,4,5); it is assumed that 50% of patients will have at least one episode of pouchitis within a year after reversal of relieving ileostomy (6). There are considerable inconsistencies of the literature data on pouchitis incidence which ranges from 2.9% (7) to 77% in some populations (8).

Stenosis of the anastomosis between the rectal canal and the intestinal pouch is a relatively rare complication developing in approximately 2% of patients (9). It negatively affects the patients’ quality of life and may be an important factor contributing to the development of pouchitis (10). In the case of anastomotic stenosis, the standard procedure is its dilation.

Dysplastic and malignant transformations of the intestinal pouch mucosa have been described much less commonly than inflammatory changes. In the group of patients undergoing restorative proctocolectomy for FAP, dysplastic and malignant lesions are more common and are associated with the molecular background of this genetic disorder due to a mutation in the APC gene. The incidence of dysplastic lesions in patients operated on for UC is lower, although also in this case, the presented results display high discrepancy. In a meta-analysis of 23 studies in 2040 patients, dysplasia incidence ranged from 0% to 18.5%, and the mean risk of dysplasia was estimated at 1.1% (11). It has been suggested that serious chronic inflammatory lesions are an important contributing factor for dysplasia and cancer (12,13), where it may be present in 9.1-27.3%, depending on the evaluating pathologist (14).

The basic tests to assess the morphology and function of an intestinal pouch include pouch endoscopy with biopsy (6), particularly important in the context of chronic pouchitis (2). This examination is usually performed with a flexible sigmoidoscope or esophagogastroscope (15). Most authors recommend endoscopy with biopsy also as a necessary element of the diagnostics of intestinal pouch mucositis (4). On the other hand, a histopathologic examination is an important element of chronic pouchitis (16, 17). Several scales of inflammation scoring exist; the one which is currently most commonly applied is modified PDAI (Pouchitis Disease Activity Index) presented by the Mayo Clinic group in 1994 (18).

Follow-up examinations of an intestinal pouch in patients who underwent restorative proctocolectomy are an inherent element of postoperative care in this patient group. The frequency, scope and time of initiation of these examinations have not been unequivocally established and depend above all on the institutional standards (4, 6, 17). Although restorative proctocolectomy in UC and FAP patients is performed in the same manner, the differences in aetiology and symptomatology between these disorders may contribute to considerable differences in the postoperative course.

The objective of the present study was to investigate the incidence of intestinal pouch complications following restorative proctocolectomy and the differences in the postoperative course between the patients operated for UC and for FAP.

MATERIAL AND METHODS

Data from 138 patients after restorative proctocolectomy performed between 1985 and
2008 were analysed. In this group, 87 and 51 patients underwent surgery for UC and FAP, respectively. The patients underwent surgical treatment in the General, Gastroenterological and Endocrine Surgery Department and in the General and Colorectal Surgery Department of the K. Marcinkowski Medical University in Poznań. Clinical data from routine follow-up visits performed in 2004-2008 were the basis for assessment. The study was retrospective and was based on the analysis of the findings at follow-up examinations in Hospital Outpatient Clinics.

The standard adopted for the study was annual clinical examinations including pouch endoscopy supplemented by biopsy and potentially other examinations and tests in function of the symptoms reported by the patient. Endoscopic examinations were performed in a vast majority of patients on an outpatient basis, with the use of a rigid rectosigmoidoscope with a 8 or 15 mm gauge, depending on the anastomosis width as assessed by digital rectal examination. A flexible colonoscope was used for the examination in some of the cases. To enable full evaluation of the degree of mucosal transformation and to perform PDAI scoring of the inflammatory lesions, pouch mucosa specimens were routinely collected (usually two).

Pouchitis was diagnosed on the basis of the PDAI score (18). The PDAI scale is based on a combined assessment of clinical, endoscopic and histological findings (the so-called Moskowitz histological index).

The clinical findings in pouchitis are abdominal pain, the number of bowel movements at least twice the average in this patient group, body temperature ≥ 37.8°C, bleeding. The assessed endoscopic findings are contact bleeding, secretions, mucosal oedema, erosions, absence of vascular meshwork, granulation tissue. Each of these findings is attributed one point on the scale.

In the case of acute inflammation, the presence of inflammatory infiltrate (low – 1, moderate + abscesses in crypts – 2, severe + abscesses in crypts – 3), the presence of ulcerations (<25% of the vision field – 1, 25-50% – 2, >50% – 3) are assessed on histological examination. In the case of chronic inflammation, the assessment includes inflammatory infiltrate (low – 1, moderate – 2, severe – 3) and villous atrophy (partial – 1, almost complete –2, complete – 3). The final assessment is based on totalling the partial scores. Inflammation was diagnosed when the total score was equal to or higher than 7.

Furthermore, the following clinical symptoms reported by the patients were assessed on each occasion: increased number of bowel movements during day and night (twice the normal number), admixture of blood and/or mucus, abdominal pain and body temperature elevated to ≥ 37.8°C. The presence of dysplasia or malignant transformation, the risk of another stomy creation procedure, the risk of pouch reversal, and sphincter function were also evaluated. The above-described data were collected in the form of an Excel database and subjected to statistical analysis.

Each result of the specimen examination included the inflammation score on the Moskowitz scale and villous atrophy score on the Laumonier scale.

The Laumonier scale was used to assess small intestine mucosa transformation towards large intestine mucosa. This is a four-point scale where I° denotes low-grade transformation towards colonic mucosa (increased number of mucous cells, normal villi length) and the subsequent scores denote gradually increasing resemblance up to IV° where the so-called “colonisation” is diagnosed (an increase in the number of mucous cells >45% of the population of mucosal cells, considerable shortening of villi; massive inflammatory infiltration within the lamina propria of the mucosal membrane).

Dysplasia was diagnosed on the basis of the above-described routine examinations performed by two histopathologists. Dysplasia was assessed on a two-point scale as low- or high-grade dysplasia.

Anorectal manometry performed in all study patients. The examination was performed using the standard technique, with the use of the PC Polygraf HR system intended for inpatient examinations of the upper and lower gastrointestinal tract. Data were analysed with the use of the Polygram software, Synectics Medical. Particular attention was paid to assessment of the sphincter apparatus function and maximum volume (the maximum balloon volume tolerated by the patient).

Statistical analysis

The incidence of dysplasia, cancer and proctocolectomy complications at various times
post-surgery was presented in the tabulated form including absolute numbers and percentage rates of the total size of the groups studied. The univariate analysis of the incidence of individual surgical complications was performed with the exact Fisher's test. Estimation of the time to dysplasia as an additional negative prognostic factor in patients with pouchitis was performed by the Kaplan-Meier method. The adopted statistical significance level was $p<0.05$. Statistical calculations were performed with the use of StatXact (Cytel Inc) and MedCalc (MedCalc Software).

RESULTS

The presence of complications following restorative proctocolectomy

In 2004-2009, a total of 846 endoscopic examinations were performed at both study sites within 2 to 19 years after the restorative procedure. No significant complications of the endoscopic examination were found. In 5 cases, slight bleeding was found after biopsy, which resolved spontaneously (2 cases) or required coagulation (3 cases). None of the patients required hospitalization.

Significant clinical complications were found in 45 patients (32.4%). Some patients developed two or more concomitant complications, e.g. the presence of inflammation and dysplasia or the presence of cancer and the necessity for pouch resection.

The most common of the complications observed were pouchitis (fig. 2) and dysplasia (fig. 3). Their incidence data are presented in tab. 1.

Other analysed complications occurred rarely and affected 6 patients (4.3%). Surgical intervention was necessary in 5 patients (3.6%). In one case of a patient who underwent surgery for UC, the pouch had to be resected due to severe inflammatory lesions within the pouch, rectal canal and perianal region. In two patients operated on for FAP pouch resection was necessary in view of the diagnosis of a malignancy within the intestinal pouch (adenocarcinoma). One patient, who underwent surgery for UC, developed severe faecal incontinence. In view of inefficacy of conservative treatment, the patient was referred for surgical treatment (loop ileostomy creation) to which he did not agree. The complications are presented in tab. 2.

Differences in the postoperative course between patients operated on for UC and those operated on for FAP

**Age of patients.** A significant difference in age was observed between patients operated on for UC and those operated on for FAP (Mann-Whitney test; $p=0.0317$). The mean age in the first and second groups was 35.3 and 31.1 years, respectively. Also the standard deviation was significantly higher in the group

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Fig. 2. Intestinal pouch mucosa, visible inflammation signs: ulcerations, fibrin, bruising, oedema

Fig. 3. Intestinal pouch with numerous polyps, on histological examination – tubular adenoma with low-grade dysplasia (status post-restorative proctocolectomy for FAP 12 years earlier)
Intestinal pouch complications after restorative proctocolectomy for UC and FAP

lower than in the second group (8.62 years).

Dysplasia of intestinal pouch mucosa. A significantly higher incidence of low- and high-grade dysplasia in patients operated on for FAP was found in comparison with patients operated on for UC (tab. 1). Low-grade dysplasia occurred in 19.6% of patients operated on for FAP and in 2.3% of patients operated on for UC (statistically significant difference, exact Fisher’s test; \( p=0.0008 \)). High-grade dysplasia had a significantly higher incidence in patients operated on for FAP – 9.8% – than in those operated on for UC – 1.1% (statistically significant difference, exact Fisher’s test; \( p=0.0250 \)). Furthermore, the time to dysplasia after the procedure was analysed. In the group of patients who underwent proctocolectomy the mean time after surgery was longer in patients with diagnosed dysplasia, where it was 206 months. In the group of patients without dysplasia, the mean follow-up time was 139 months (statistically significant difference, U Mann-Whitney test; \( p=0.0078 \)). A statistically significant difference was also found (U Mann-Whitney test; \( p=0.0019 \)) in the post-surgery time to dysplasia development between patients operated on for UC (139 months) and those operated on for FAP (219 months).

Pouchitis. It was found in total 37 patients (26.6%). It affected 27 of the patients operated on for UC (30.1%). Among patients operated on for FAP, pouchitis was diagnosed in 10 cases (19.6%). However, the incidence of inflammation did not significantly differ between the analysed groups (test \( \chi^2 \); \( p=0.1535 \)). In the case of patients with diagnosed primary FAP, the mean time post-surgery for the group with dysplasia was 219 months and for patients without dysplasia it was 159 months (statistically significant difference, U Mann-Whitney test; \( p=0.0078 \)).

Furthermore, the severity of pouchitis on the PDAI scale was analysed. In the group of patients operated on for UC, the mean PDAI was 5.4 and in patients operated on for FAP the mean PDAI was 4.6. This difference was statistically significant (U Manna-Whitney test; \( p=0.0368 \)).

Intestinal pouch mucosa transformation (Laumonier classification). The degree of shortening of intestinal villi assessed on the Laumonier scale was analysed. In the group of patients operated on for UC, the mean Laumonier score was 2.7, while among those who underwent surgery for FAP villous atrophy

Table 1. Incidence of pouchitis and pouch mucosal dysplasia. The percentages of the given group within the whole study sample are shown between brackets

<table>
<thead>
<tr>
<th>Total number of patients</th>
<th>Inflammation</th>
<th>Low-grade dysplasia</th>
<th>High-grade dysplasia</th>
<th>Cancer within pouch</th>
</tr>
</thead>
<tbody>
<tr>
<td>138</td>
<td>37 (26.81%)</td>
<td>12 (0.87%)</td>
<td>6 (4.35%)</td>
<td>2 (1.45%)</td>
</tr>
<tr>
<td>51</td>
<td>10 (7.25%)</td>
<td>10 (7.25%)</td>
<td>5 (3.62%)</td>
<td>2 (1.45%)</td>
</tr>
<tr>
<td>87</td>
<td>27 (19.56%)</td>
<td>2 (1.45%)</td>
<td>1 (0.72%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>statistically significant difference</td>
<td>no</td>
<td>p=0.0008</td>
<td>p=0.0250</td>
<td>not measured</td>
</tr>
</tbody>
</table>

Table 2. Incidence of diverting ileostomy, intestinal pouch resection and severe faecal incontinence. The percentages of the given group within the whole study sample are shown between brackets

<table>
<thead>
<tr>
<th>Necessity for diverting ileostomy</th>
<th>Necessity for pouch resection</th>
<th>Faecal incontinence (IV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAP 1 (0.72%)</td>
<td>2 (1.45%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>UC 1 (0.72%)</td>
<td>1 (0.72%)</td>
<td>1 (0.72%)</td>
</tr>
</tbody>
</table>

operated on for UC (11.01 years) than in the second group (8.62 years).

Dysplasia of intestinal pouch mucosa. A significantly higher incidence of low- and high-grade dysplasia in patients operated on for FAP was found in comparison with patients operated on for UC (tab. 1). Low-grade dysplasia occurred in 19.6% of patients operated on for FAP and in 2.3% of patients operated on for UC (statistically significant difference, exact Fisher’s test; \( p=0.0008 \)). High-grade dysplasia had a significantly higher incidence in patients operated on for FAP – 9.8% – than in those operated on for UC – 1.1% (statistically significant difference, exact Fisher’s test; \( p=0.0250 \)). Furthermore, the time to dysplasia after the procedure was analysed. In the group of patients who underwent proctocolectomy the mean time after surgery was longer in patients with diagnosed dysplasia, where it was 206 months. In the group of patients without dysplasia, the mean follow-up time was 139 months (statistically significant difference, U Mann-Whitney test; \( p=0.0078 \)). A statistically significant difference was also found (U Mann-Whitney test; \( p=0.0019 \)) in the post-surgery time to dysplasia development between patients operated on for UC (139 months) and those operated on for FAP (219 months).

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was more severe; the mean score on the Lau-emonier scale was 3.1. This difference was statistically significant (U Mann-Whitney test; p=0.0148).

Other symptoms and parameters analysed. The statistical analysis did not reveal any significant differences between the groups of patients operated on for UC and FAP with respect to clinical symptoms, the necessity for diverting ileostomy, the necessity for pouch resection, endoscopic signs of inflammation, maximum tolerated volume and other parameters assessed by anorectal manometry.

DISCUSSION

Presence of clinical complications in patients who underwent restorative proctocolectomy for UC and FAP

The most common complication in the patients analysed was pouchitis, present in 37 (26.6%) of the cases. It was more prevalent among patients operated on for UC (27 patients), and less frequent in patients operated on for FAP (10 patients). In the literature, pouchitis is indicated as the most common complication of restorative proctocolectomy. The incidence of pouchitis observed in this study is relatively low in comparison with other studies. It seems that this may be attributed to prophylaxis of inflammation implemented in both sites from which the analysed material originated. At an early stage (day 3-4 after restorative proctocolectomy) intestinal pouches are rinsed with 0.9% normal saline and metronidazole. On one hand, this procedure reduces the volume of residual bowel content which may irritate pouch mucosa and favour the growth of the pathogenic intestinal flora. The use of metronidazole seems to considerably reduce the development of the pathogenic intestinal flora which may represent one of the factors predisposing to pouchitis (19). At both sites treating the analysed patients, probiotics are also administered on a routine basis to patients who underwent restorative proctocolectomy. On the basis of our experience, it seems that probiotics have no significant effect on resolution of acute and severe inflammation (20). However, they may constitute an important element of pouchitis prophylaxis, especially in patients with chronic inflammation (21).

Dysplastic and cancer lesions were found in total in 20 patients (14.8%), 17 of whom were patients operated on for FAP (12.2% of the FAP group). In patients operated on for UC, they were diagnosed in 3 cases (2.6%). Dysplastic and malignant lesions occur mainly in patients subjected to restorative proctocolectomy for FAP. The incidence and time course of dysplasia development within an intestinal pouch are still being disputed. Differences between the published results are high, they range between 8 and 74% of patients undergoing proctocolectomy for FAP (22, 23). Without a doubt, the most significant factor contributing to dysplastic lesions is time from the operation. The prevalence of adenomas was assessed as 7%, 35% and 75% at 5, 10 and 15 years, respectively (24). In the case of patients operated on for UC, dysplastic lesions are much less common. Their incidence is variously quoted as 0% to 18.5%, and the mean dysplasia risk is assessed as 1.1% (11). In all cases where dysplasia was found within the intestinal pouch mucosa in patients operated on for UC, the presence of pouchitis was also diagnosed.

Other complications analysed (the necessity for pouch resection, the necessity for diverting ileostomy and severe faecal incontinence) were found only in 6 patients (4.3%) in total. Temporary loop ileostomy was created in two patients (1.4%) with severe inflammation of an intestinal pouch. One patient (0.7%) underwent proctocolectomy for UC and the second patient underwent proctocolectomy for FAP (0.7%). The management of relapsing cases intestinal pouch mucositis refractory to pharmacological treatment remains a clinical challenge (25). Routine inflammation treatment includes antibiotics, especially ciprofloxacin and metronidazole (25). The use of sulphasalazine and mesalazine is also justified, particularly in patients operated on for UC (26). Similarly as metronidazole, the products of this class can be administered both orally and rectally. In refractory cases, it is possible to initiate steroids or azathioprine (27). Furthermore, treatment should include probiotics and an individually established diet (28). Despite such an extensive array of pharmacological options in the treatment of pouchitis, clinical improvement sometimes cannot be obtained, similarly to some cases of unspecific enteritis. If inflammation is accompanied by deteriorating systemic manifestations, pro-
gressive cachexia and anaemia, surgical intervention becomes necessary. When no irreversible inflammatory and proliferative lesions are developed within the rectal canal and sphincters, temporary loop ileostomy creation is possible. Temporary elimination of an intestinal pouch from the intestinal transit significantly contributes to resolution of inflammatory lesions. Such intervention rapidly and effectively reduces fluid loss and bleeding from the inflamed intestinal pouch mucosa (4). After loop ileostomy is created, the patient’s clinical condition rapidly improves and inflammatory lesions of the pouch mucosa gradually resolve. These patients are monitored and they await the decision on gastrointestinal tract continuity restoration.

In one case (0.7%) of a patient operated on for UC, pouch resection along with the sphincters was necessary due to severe inflammation within the pouch, rectal canal and perianal area. The lesions caused complete fibrosis of sphincters and their total insufficiency. Despite temporary ileostomy creation, the perianal inflammatory lesions deteriorated. Crohn’s disease was taken into account in the differential diagnosis, but there were no signs of this disorder on histological examination. In view of severe complaints related to inflammation of the anal area and irreversible damage within the sphincter apparatus, a decision was made to perform definite pouch resection along with the sphincters.

In two cases (1.4%) of patients operated on for FAP, the presence of malignancy was found. Such lesions were diagnosed in patients who had a long interval between the subsequent follow-up examinations (9 and 14 years). In both cases, radical pouch resection along with the sphincters was performed. One patient, despite the use of adjuvant treatment, died 3 years after pouch resection, and the second patient is currently being monitored (13 months after pouch resection, adjuvant radiochemotherapy). Both cases highlight the need for follow-up examinations but also for explaining the necessity for continued monitoring to the patients.

Faecal continence disturbances in patients who underwent proctocolectomy may affect about 25% of the cases (29). Their incidence increases with age but they are usually episodic and do not significantly affect the quality of life (29). Severe faecal incontinence (grade IV – complete gas and faecal incontinence) is very rarely a cause of diverting ileostomy or pouch resection (30). In the analysed group, only one patient (0.7%), operated on for UC developed complete faecal incontinence. Despite the ileostomy indications, the patient did not agree to surgery. The patient regulates the number of bowel movements and stool consistency with a diet, he uses hygienic pads on permanent basis and defines his quality of life as acceptable.

The overall incidence of the observed complications requiring ileostomy or pouch resection was low. Such operation was necessary in 5 patients (3.5%). The frequency of such surgical procedures quoted in the literature attains up to 10%, and the risk of diverting ileostomy or intestinal pouch resection increases with the time after the procedure (31). Therefore, it should be noted that the analysed patient group is characterised by a relatively low rate of complications requiring surgical intervention.

Differences in the postoperative course between the patient groups studied

Were found a statistically significant age difference between the patients operated for different indications. The mean age in patients operated on for UC and FAP was 35.3 years and 31.1 years, respectively. This difference is related to the mechanism of pathological lesions in both these disorders and with their clinical course. Ulcerative colitis is a disorder which develops slightly later, the mean age of the affected patients is about 45 years (32). Familial adenomatous polyposis is a genetic disease. Therefore, it is an inborn disorder whose macroscopic manifestation (polyps) develops in adolescence and malignant transformation may occur early.

Pouch mucositis was present slightly more frequently in patients operated on for UC (30.7%) than in patients operated on for FAP (19.6%). However, these differences were not statistically significant. However, significant differences were found with respect to inflammation severity assessed on the PDAI scale. In the case of patients operated on for UC, the mean PDAI was 5.4 and in patients operated on for FAP it was 4.6. This difference was statistically significant and suggests that in the group of patients operated on for UC
pouchitis lesions were more severe, which may result from more severe symptoms and explains better compliance with follow-up examinations in these patients.

The above-presented lack of statistically significant differences in the incidence of inflammation between patients operated on for UC and those operated on for FAP still remains a very interesting and certainly disputable issue. A predominating view in a vast majority of studies is that pouchitis occurs with a significantly higher incidence in patients operated on for UC (6). However, there are also reports according to which the incidence of pouchitis may be similar in both groups (28).

A relatively high rate of pouchitis in the group of patients operated on for FAP may result from the nature of the study. The study was conducted in a group of all patients visiting Hospital Outpatient Clinics. It is known that the patients came to their visits earlier in the case of an episode of pouchitis. Also patients with chronic inflammation came to follow-up examinations more frequently, which increased the probability of diagnosing pouchitis. Our analysis of clinical symptoms (hypogastric pain, diarrhoea, mucus admixture, elevated body temperature) also did not reveal any statistically significant differences between the patients operated on for UC and those operated on for FAP. Analysing the observed rate of pouchitis, we should also bear in mind the special nature of the group of patients with FAP who underwent prophylactic proctocolectomy, often in the pre-symptomatic period. Before surgical treatment, these patients defined their general wellbeing as good or very good. After the operation and restoration of gastrointestinal tract continuity, they were much more critical in their assessment of their health status, carefully observing and remembering all abnormalities such as abdominal pain, diarrhoea, bleeding or body temperature elevation. This is directly translated into a much higher incidence of subjective inflammation symptoms and the associated higher PDAI scores. Another potential cause of diagnosing a high rate of pouchitis lesions in patients who underwent proctocolectomy for FAP is their special social and economic status. Many of these persons are unemployed or persons who lost their jobs due to surgical treatment. Social benefits often remain the only source of their income. Reporting a series of hardly verifiable subjective symptoms results in obtaining by them favourable medical certificates which attest the presence of a severe disorder. On the other hand, each of the reported symptoms increases the PDAI score, and pouchitis must be diagnosed with a score not lower than 7.

A parameter which differed with the highest statistical significance between the operated groups was the presence of both low- and high-grade dysplasia. Low-grade dysplasia occurred in 19.6% of patients operated on for FAP and in 2.3% of patients operated on for UC. High-grade dysplasia occurred in patients operated on for FAP and UC in 9.8% and 1.1%, respectively. In both cases, a statistically significant correlation between the groups was found. The above observations are consistent with the reports by other authors (14). Dysplasia in patients operated on for FAP occurs most commonly in the macroscopic form of polyps (Fig. 11, Material and Method). Regular endoscopic monitoring combined with polypectomy is the best method of protection from malignant transformation of these lesions. However, it should be emphasised that these lesions usually appear only several, even more than ten, years after the procedure. In the case of patients with a primary diagnosis of FAP, the mean time after operation for the groups with and without dysplasia was 159 months and 219 months, respectively; the difference was statistically significant. The high incidence of polyps within the pouch seems to be associated with a mutation of the APC gene which underlies familial polyposis (33). The adaptive processes which transform pouch mucosa towards colonic mucosa have a positive effect on the quality of life of the operated patients. However, on the other hand they gradually increase the risk of dysplasia and thus the risk of cancer within the pouch.

Dysplasia within the pouch was diagnosed much less frequently in patients operated on for UC. Low-grade dysplasia was diagnosed in 2 patients (2.2%), high-grade dysplasia was diagnosed in 1 patient (1.1%). In this patient group, in contrast to the patients operated on for FAP, no correlation was found between the lapse of time and dysplasia presence. In patients with dysplasia, the mean time from operation was 139 months and in those without dysplasia it was 130 months, and this difference was not statistically significant. On the other hand, a correlation was observed be-
between dysplasia presence and the presence of inflammation. All dysplasia cases were diagnosed in patients with a chronic inflammatory process whose mean PDAI was 9. These observations confirm the findings of other authors who highlight the role of chronic inflammation, especially of high severity, as a risk factor for dysplasia (34).

Summing up the comparison of the parameters studied between the two groups of patients who underwent restorative proctocolectomy, it should be noted that the clinical course of these patients and their basic symptoms are very similar. Similarly with the macroscopic and microscopic inflammation of the pouch mucosa and its maximum tolerated volume. The main differences include higher severity of inflammation in patients with UC, which may constitute a risk factor for dysplasia in isolated cases. In the group of patients operated on for UC, the most important problem seems to be the risk of appearance of dysplastic lesions within the pouch, which increases with age.

CONCLUSIONS
1. The most common complications of restorative proctocolectomy were pouchitis and dysplasia. Other complications, including the necessity for diverting ileostomy or pouch resection, occurred very rarely and were usually the consequence of chronic pouchitis. The general rate of complications in the analysed material was low as compared with literature data. This may be partly attributed to prior prophylaxis of intestinal pouch inflammation.

2. The mean age of patients operated on for familial adenomatous polyposis was lower than in those operated on for ulcerative colitis (the difference was statistically significant). Patients operated on for ulcerative colitis (UC) more frequently developed pouchitis (no statistical significance) and had more severe inflammatory lesions (the difference was statistically significant). In patients operated on for familial adenomatous polyposis (FAP), low- and high-grade dysplastic lesions were more common (the difference was statistically significant); the same applied to cancer lesions (no statistical significance). The degree of villous atrophy was significantly higher in the group of patients operated on for FAP. Clinical symptoms were similar in both patient groups.

3. Both patients operated on for ulcerative colitis and those operated on for familial adenomatous polyposis require regular follow-up examinations. In the case of patients operated on for ulcerative colitis, it is important to diagnose and treat pouchitis early. The examination can be performed with the use of a rigid rectosigmoidoscope and include mucosal biopsy to assess inflammation severity. Patients operated on for familial adenomatous polyposis should undergo flexible sigmoidoscopy. Particular attention should be paid to the presence of polyps and care should be taken to perform their resection possibly early. The care of patients post restorative proctocolectomy and follow-up examinations should be carried out by specialised centres.

REFERENCES


