Stoma complications occur in 21-75% of patients, and 30% of them require redo surgery within 10 years after previous surgical treatment. Medical treatment is successful in most cases with no need for surgery. However, severe stoma complications are the real challenge for medical team and require an individual approach to each patient.

The aim of the study was to report stoma patients with severe complications of both ileo- and/or colostomy and present different options of medical treatment.

Material and methods. Between March 2005 and April 2007 we treated 8 patients with severe stoma complications at the Department of General and Colorectal Surgery, Medical University of Łódź. There were 4 patients with colostomy, 3 patients with ileostomy and one patient with both ileo- and colostomy. The mean age of patients was 56.7 years (range 30-68 years).

Results. In all patients we achieved either complete stoma-related wound healing or we observed substantial progress of wound healing with medical treatment. No patient required surgery for stoma complications.

Conclusions. Stoma complications still occur in spite of adherence to rules of stoma care and surgical technique. Most of them can be treated conservatively. Much emphasis is put on close team work comprising doctors and nurses in the treatment of severe stoma complications.

Key words: stoma, treatment of complications

Due to increasing incidence of tumours and inflammatory diseases of the large intestine and rectum as well as increasing number of injuries due to traffic accidents and bullet wounds, the number of ileostomies and colostomies has not decreased for the last thirty years, despite dynamic development of surgical methods, including stapler methods (1-6). Wider application of reconstruction methods associated with creation of ileoanal reservoirs and low anterior resection of the rectum also contribute to the increasing number of ileostomies and colostomies (7, 8).

First stomas formed most likely as a result of abdominal wounds; therefore, the history of the stoma is probably as long as the history of mankind. For a long time, formation of a stoma by means of a surgical procedure was unknown. Stomas formed “spontaneously” as a result of bowel diseases, and, even more likely, due to combat or hunting accidents. First records concerning surgical formation of a stoma as a method of treatment of various conditions appeared in the 18th century (1, 2, 9, 10).

In a patient with a stoma, one of the main treatment goals is to achieve and maintain good quality of life. This is based on a correct surgical procedure and appropriate stoma care using available products as well as acceptance of the stoma by the patient and its effect on their professional and sexual life, ability to take part in sport or cultural activities, and general well-being (1, 2, 3, 11, 12). Technical aspects of stoma formation depend mainly on the operator's expertise and experience. Selection of a stoma site prior to the surgery and appropriate operational technique make it possible to reduce the number of possible complications (2, 12, 13, 14).
Indications for stoma formation and stoma types as well as early and late topical and systemic complications associated with formation of an ileostomy or colostomy are widely known. Stoma complications are present in 21-70% of patients and 30% of stoma patients require redo surgery within 10 years after the primary surgery (2, 4, 7, 13-18). At present, treatment of a properly formed stoma poses no serious problems. In contrast, treatment of a “difficult” stoma, i.e. a stoma associated with various complications and/or peristomal skin lesions, is a real challenge for the therapeutic team as well as the patient. Effective treatment of a complicated stoma involves not routine activities but an individual approach to each patient.

The aim of this study is to present proposed solutions for treatment of a complicated, “difficult” stoma, based on our experience.

**MATERIAL AND METHODS**

Between March 2005 and April 2007, serious stoma complications were observed in 8 patients (2 women and 6 men), of whom seven underwent primary surgery at our department. In the same time, 174 colostomies and 103 ileostomies were performed at the Department. Patients’ characteristics are presented in tab. 1. The mean age of patients was 56.7 years (range: 30-68 years). In 4 cases the complications were related to a colostomy, in 3 cases – to an ileostomy, and in one patient both an ileostomy and a colostomy were present. All patients with stoma complications underwent conservative treatment using the available stoma equipment and stoma care products. In one patient irrigation proved effective. Surgery due to stoma complications was not necessary in any of the patients. Cases of spe-

<table>
<thead>
<tr>
<th>No.</th>
<th>Gender</th>
<th>Age</th>
<th>Underlying disease</th>
<th>Stoma type (ileo- or colostomy)</th>
<th>Stoma complication type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M</td>
<td>30</td>
<td>Crohn’s disease</td>
<td>single barrel colostomy and terminal ileostomy</td>
<td>colostomy pulled inwards; skin lesions around the ileostomy</td>
</tr>
<tr>
<td>2</td>
<td>M</td>
<td>68</td>
<td>rectal cancer</td>
<td>colostomy after a Hartmann’s procedure</td>
<td>stoma narrowed and pulled inwards; peristomal skin lesions</td>
</tr>
<tr>
<td>3</td>
<td>F</td>
<td>66</td>
<td>endometrial cancer; status post panhysterectomy and radiotherapy; postirradiation rectovaginal fistula and non-malignant sigmoid stenosis</td>
<td>double barrel transverse colostomy</td>
<td>iatrogenic skin injury at the site of colostomy attachment</td>
</tr>
<tr>
<td>4</td>
<td>M</td>
<td>73</td>
<td>sigmoid cancer and eventration</td>
<td>loop ileostomy</td>
<td>skin inflammatory lesions around the stoma</td>
</tr>
<tr>
<td>5</td>
<td>M</td>
<td>49</td>
<td>rectal cancer (2004) with a relapse in the abdominal wall (2007)</td>
<td>sigmoid colostomy after a perineo-abdominal excision of the rectum</td>
<td>opening of the wound (skin and subcutaneous tissue) after excision of the relapse, causing detachment of the stoma equipment</td>
</tr>
<tr>
<td>6</td>
<td>F</td>
<td>60</td>
<td>inflammatory tumour of the small pelvis, involving the rectosigmoid junction and a loop of the ileum; status post appendectomy (1980), right adnexectomy (1996), and panhysterectomy (2002)</td>
<td>double barrel sigmoid colostomy and loop ileostomy</td>
<td>peristomal skin inflammation</td>
</tr>
<tr>
<td>7</td>
<td>M</td>
<td>61</td>
<td>multiple colorectal polyps; status post right hemicolecotomy (1973)</td>
<td>diverting ileostomy after a reconstruction proctocolectomy</td>
<td>peristomal erosive skin lesions</td>
</tr>
<tr>
<td>8</td>
<td>M</td>
<td>47</td>
<td>rectal cancer</td>
<td>sigmoid colostomy after a perineo-abdominal excision of the rectum</td>
<td>flattening of the colostomy in the course of superficial, marginal stoma necrosis</td>
</tr>
</tbody>
</table>
cific stoma complications as well as methods and results of treatment are discussed below.

RESULTS

1. The first patient, a man aged 30, was hospitalised due to Crohn’s disease. Due to disease complications, drainage of interloop abscesses was applied, a part of the small intestine with the primary stoma was resected, and a Hartmann’s procedure was performed. After 22 days following the surgery, the patient underwent another operation due to the signs of peritonitis. Perforation of the small intestine was found and terminal ileostomy was created. The patient was hospitalised at the department for 40 days. In the first days following the surgery, colostomy was treated using a flat system. Due to a tendency to pull the stoma inwards and the anatomy of the patient’s abdominal wall, the skin around the stoma was treated with sealing and healing paste in order to prevent leaking of intestinal contents and skin irritation; in addition, a concave Convex plate was placed. Due to the presence of skin folds, in order to prevent leaking and skin irritation with intestinal contents, the ileostomy was also treated using a Convex system. Problems with caring for the stoma and the adjacent skin appeared 2 months after the patient was discharged. A wound developed below the stoma, at the site where a drain was previously placed, which reduced adhesion of the stoma plate; the stoma itself was barely above the skin as the patient put on weight since the time of the surgery. Allergic lesions developed on the skin around the stoma as the patient used adhesive plaster to attach the plate. Sealing paste was used to protect the skin around the stoma and hydrocolloid dressing was applied in order to prevent secondary infection of the wound due to leaking of intestinal contents. On the skin thus prepared, a Convex plate was applied and its edges adjacent to inflammatory lesions were protected with special hydrocolloid bands (fig. 1). A stoma bag was attached to the plate and an additional supporting band was applied to the plate in order to press it and seal against the skin. Inflammatory skin lesions were treated with a healing cream. After five days the lesions began to heal and get covered with epidermis.

2. Another patient, aged 68, underwent an emergency operation due to rectal cancer with obstruction. The patient underwent surgery (a Hartmann’s procedure) in another hospital. After 5 months following the surgery the patient was hospitalised again, this time at our department. He was admitted due to stopped passage of stool and gas. The stoma was narrowed and pulled inwards, and the skin around the colostomy was irritated and inflamed (fig. 2). The stoma was successfully dilated using Hegar’s dilators. The patient was offered to switch from a one-piece stoma system to a two-piece Convex system. The skin around the stoma was carefully washed and dried, and then treated with Stomahesive powder. This

Fig. 1. Patient No. 1. Allergic inflammatory skin lesions. Sealing paste around the stoma, with hydrocolloid dressing and a Convex plate

Fig. 2. Patient No. 2. The colostomy narrowed and pulled inwards, with inflammatory skin lesions around the stoma
product dries the skin and absorbs inflammatory exudate; in addition, it enhances maintenance of sealing paste and thus improves healing. After application of sealing and healing paste, a Convex plate was placed and a stoma bag was attached. Inflammation around the stoma was markedly reduced after 2 weeks of treatment and the colostomy function was normal.

3. In another patient, a 66-year-old woman, skin below the stoma was cut during intraoperative shortening of a rod placed under a transverse loop colostomy. The incision was closed with four single sutures. On the fifth day after the surgery, it became difficult to attach stoma bags and effectively secure the stoma as serous fluid started to ooze out of the wound below the stoma and detach the stoma bag (fig. 3). Then, the wound in the lower part of the stoma increased so that there was no dry surface to which the stoma bag could be attached. The patient was proposed to use a Convex plate. The wound under the plate was covered with healing paste on which sealing paste or a hydrocolloid dressing was used. In order to increase tightness and prevent leaking of intestinal contents between the skin and the plate, a supporting band was applied to the plate. The wound was healed and covered with epidermis after 2 weeks. The patient was able to treat her stoma according to the applied protocol, using a Convex system and sealing paste.

4. Another patient, a 73-year-old man, was admitted to the department with symptoms and signs of intestinal obstruction in the course of a sigmoid tumour. A sigmoid resection was performed and a primary left-sided colorectal anastomosis was created; in addition, a 10 cm section of the ileum involved in the neoplastic infiltration was excised and both ends of the ileum were brought to the surface of the abdomen in the form of a double barrel ileostomy. On the 10th day after the surgery, eventration occurred; after the procedure, inflammatory lesions developed in the skin and subcutaneous tissue around the stoma. After another several days, two ulcers developed, preventing effective treatment of the stoma (fig. 4). Skin ulcers were filled with healing paste (fig. 5) over which a GX ring was placed in order to separate oily healing paste from the surface on which the plate was attached (fig. 6). In addition, the skin was covered with sealing and healing paste in order to make the surface smooth and the junction tight; on this, a Con-
A convex plate was placed, to which a stoma bag and a supporting band were attached (fig. 7). On the 47th day after the primary surgery, after the abdominal wound and the wounds around the stoma were cleared, and the patient’s nutritional parameters and water-electrolyte balance improved, the continuity of the gastrointestinal tract was restored.

5. A 49-year-old man reported to the department due to a relapse in the abdominal wall, three years after a abdominoperineal resection excision of the rectum due to rectal cancer. On the fifth day after resection of the malignant lesion from the abdominal wall, the wound below the colostomy opened, causing detachment of the stoma bag (fig. 8). The wound below the stoma was dressed with bordered hydrocolloid dressing so that hydrocolloid could act directly on the wound. The dressing was left in place for 2-3 days and a self-dischargeable stoma bag (the same as the patient used before) was attached. Thus, normal stoma function was maintained and the wound was separated from intestinal contents, making wound healing possible.

6. Another patient, a woman aged 60, underwent appendectomy in 1980, classic cholecystectomy in 1994, and right ovariectomy in 1996. She was then hospitalised several times due to an inflammatory tumour of the small pelvis; eventually, panhysterectomy was performed in 2002. In 2005 she was admitted to the department with symptoms and signs of intestinal obstruction. An inflammatory tumour of the small pelvis, involving the rectosigmoid junction and significantly narrowing the intestine, was found, along with numerous postoperative adhesions. In addition, the inflammatory infiltrate involved a loop of the ileum. A fragment of the small intestine was excised and an end-to-end anastomosis was created; on the sigmoid, a loop colostomy was formed as massive inflammatory infiltration prevented excision of that part of the intestine. On the fifth day after the surgery, the patient underwent another operation due to leaking small intestinal anastomosis and a loop ileostomy was created. Treatment of both stomas was extremely difficult due to significant weight loss with skin loosening and suppurrative postoperative wounds. On fig. 9 the ileostomy with inflammatory reaction (A) and the colostomy (B) are presented. Treatment of the colostomy was easy after the ileostomy was created as the colostomy ceased to pass intestinal contents. Skin inflammation around the ileostomy (fig. 9A) developed due to leaking of intestinal contents between the skin and the

Fig. 6. Patient No. 4. Sealing and healing paste applied on a GX ring around the colostomy

Fig. 7. Patient No. 4. A Convex plate with a stoma bag

Fig. 8. Patient No. 5. Opening of the wound after excision of a rectal cancer relapse from the abdominal wall below the colostomy
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Plate. Before each plate change, the patient was bathed in potassium permanganate solution in order to change pH of the skin and remove paste and dirt which in water may be easily removed without excessive rubbing. A tampon was temporarily placed in the ileostomy in order to prevent outflow of intestinal contents and keep the skin dry during the change of dressings and stoma equipment. Healing powder was applied to the inflamed skin in order to dry it and alleviate the burning sensation before application of sealing and healing paste. A GX ring was placed over the paste in order to increase the prominence of the Convex plate (fig. 10). The lesions around the stoma and the postoperative wound were healed after a month. A year after the ileostomy was created, the patient was qualified for reconstruction of the small intestine continuity. On fig. 11, the patient is presented, one year after her ileostomy was removed. She had no problem with treatment of her colostomy, despite postoperative hernia. The patient wore a truss every day.

7. Another patient, a 61-year-old man, underwent reconstruction proctocolectomy due to multiple colorectal polyps (without signs of family polyposis), with formation of a temporary diverting loop ileostomy. Previously, in 1972, the patient underwent right hemicolec- tomy (its cause remained unknown as no relevant documents were available). The patient’s training as to ileostomy treatment was regular and uneventful. The patient was proposed to use self-adhesive, dischargeable equipment; application of sealing paste on a small skinfold next to the stoma was recommended. A week after discharge, the patient was readmitted to the department due to extensive skin inflammation as a result of irritation by intestinal contents. Healing powder was applied in order to dry the inflammatory lesions. Sealing and healing paste was placed around the stoma, and then a large healing plate, independent of the stoma plate, was applied to the skin in order to protect it from intestinal contents in case of detachment of the stoma plate. A hole for the Convex plate was therefore cut in the healing plate prior to its application. Skin lesions not covered by the healing plate were treated with healing cream. An additional supporting band was used to tighten the plate.

Fig. 9. Patient No. 6. Skin inflammation around the ileostomy (A); the colostomy (B)

Fig. 10. Patient No. 6. A tampon temporarily placed in the stoma. Sealing and healing paste and a GX ring around the ileostomy

Fig. 11. Patient No. 6. Status post ileostomy closure. Colostomy. Parastomal hernia
After four days of such management the skin lesions greatly improved and only small amounts of sealing paste were used around the stoma.

8. A man, aged 47, underwent a perineo-abdominal excision of the rectum with creation of a sigmoid colostomy due to rectal cancer. On the third day following the surgery, superficial stomal necrosis developed an the stoma was flattened. This prevented the patient from effective and secure attachment of a stoma bag. The patient consulted a physician and irrigation was recommended. This proved successful; after each irrigation, the patient secured the stoma with a mini-bag.

DISCUSSION

Until 1950s, life with a stoma was a nightmare for people condemned to such an existence. All available materials were used for stoma treatment, including absorbing materials (gauze, cotton), isolating materials (leaves, liniments), and various “stool containers” (leather pouches, food containers, cans, tubes etc.). The “equipment” should be replaced at least several times per day and the applied methods of care provided neither skin protection nor comfort or discretion (9). The first dedicated stoma equipment was developed in 1950s. However, it was still primitive and did not meet expectations, especially as to protection of the skin against harmful action of intestinal contents (10). Placement of an adhesive material directly on the stoma bag was a genuine revolution in production of stoma equipment. This was an idea of a Danish nurse, Elise Sorensen, whose sister, then aged 31, underwent surgery with creation of a colostomy in 1954. Elise Sorensen persuaded the owner of Dansc Plastik Emballage, a small factory manufacturing plastic bags, to produce new generation stoma bags; this was the beginning of dynamic development of Coloplast, a company producing stoma bags and stoma care products (19). Another breakthrough in stoma care was introduction of hydrocolloids. In 1964 Squibb released the first hydrocolloid dressing which quickly found application in surgery as it did not detach from warm and wet surfaces; this became a base of Stomahesive – a hydrocolloid material used to this day. In 1978 Convatec introduced the first two-piece stoma system. 1980s and 1990s were the time of dynamic development of stoma equipment and skin care products manufactured by such firms as Hollister, Dansac, or Braun (10). Proper selection of stoma equipment is essential for rehabilitation after the surgery and successful return to everyday life. Among others, the following factors should be taken into account: type of the stoma and condition of the skin around the stoma, character of stomal discharge, and the patient’s possible sensual impairment (sight, hearing), manipulative skills, and lifestyle (20-23).

In 1967 Turnbull and Weakley presented a set of rules to be applied by every surgeon attempting creation of a colostomy or ileostomy. These included: proper location of the stoma, formation of an adequate stoma channel in the abdominal wall, maintenance of normal blood supply to the stoma, loose attachment of the intestine (without tension), and appropriate suturing of the stoma to the skin. These rules are still applicable. Highlighting of individual location of the stoma prior to the surgery (both planned and emergency) is worth special attention. Such an approach makes it possible to reduce significantly the rate of postoperative stoma complications, and to ensure the best possible adhesion of the selected stoma equipment (2, 14, 17). In addition, as stressed by Person and colleagues, the lack of stoma complications has a great effect on psychological and emotional aspects of the patient’s quality of life, providing a higher degree of independence in everyday functioning (24).

Over the recent years, Poland has witnessed a major breakthrough in the field of care for the stoma patient and the quality of stoma care has improved significantly. This was, among other factors, due to specialist and training courses organised for nurses. As in Western Europe and the USA, a new speciality of the stoma nurse was instituted, and a Model of Caring for a Stoma Patient was developed under the patronage of the Polish Coloproctology Club. This presents in detail current standards of pre-, peri-, and postoperative care for a stoma patient (3, 25). Patients who are familiar with the types of available stoma equipment and hygienic procedures related to stoma care perceive their quality of life and freedom of everyday functioning as much higher. Moreover, parameters such as self-esteem, everyday activity, sexual activity, and emotional condition...
tend to improve due to a high level of services provided by trained stoma nurses (24, 26).

Complications related to the presence of a stoma observed in our patients included inwards pulling of the stoma, flattening of the stoma, peristomal inflammatory and erosive skin lesions, narrowing of the stoma, and iatrogenic skin injury at the site of colostomy attachment.

Inwards pulling of the stoma may be due to a high intestinal tension or stomal necrosis. It is observed in 1-6% of colostomies and 3-17% of ileostomies. This complication may develop in patients with inflammatory bowel diseases as well as in those who put on weight after the surgery, thus increasing thickness of the abdominal wall (7, 13, 17, 27). The colostomy was pulled inwards in 2 patients. Flattening of the colostomy due to marginal stomal necrosis was observed in one patient. Stomal necrosis may be due to the tension of the mesentery being too high, an injury to marginal vessels of the colon or vascular arcades of the small intestine, or the stoma channel being too narrow. If necrosis reaches below the fascia, laparotomy must be performed and the stoma must be reconstructed. In case of marginal, superficial necrosis, procrastination may be adopted, with daily control of the stoma. Necrotic tissue usually undergoes demarcation and a redo laparotomy is not necessary; at most, local surgical treatment of a narrowed stoma may be applied later (17).

Stoma stenosis develops in 2-10% of ileostomies and single barrel colostomies. This may be due to ischaemic intestinal necrosis or a relapse of a neoplasm or an inflammatory disease (e.g. Crohn’s disease) (13, 17). Stenosis of a colostomy developed in one patient and was successfully treated using Hegar’s dilators.

In the patients discussed here, the most common complication were peristomal inflammatory and erosive skin lesions. This is one of the most common complications, affecting 5-40% stoma patients. This complication is more likely to develop in a flat or improperly treated stoma and is more common in ileostomies. Inflammatory skin lesions may also be due to an allergic reaction to the stoma equipment; in some cases no specific initial factor causing skin irritation can be identified (13, 17).

A relapse of an underlying disease in the stoma is possible in patients with neoplasms as well as inflammatory bowel diseases, such as Crohn’s disease or ulcerative colitis. If a malignancy relapses in the stoma, wide excision of the pathological intestinal lesion and transferring of the stoma to another location is recommended (17). In the case discussed here, the relapse did not involve the stoma; nevertheless, it developed in the abdominal wall below the stoma and made wide excision of the lesion with the abdominal wall necessary. Complications related to postoperative wound healing in the vicinity of the stoma resulted in detachment of the stoma bag. Conservative treatment proved successful and transferring of the stoma was not necessary.

In one patient irrigation was applied as a method of cleaning of faecal contents from the intestine. Irrigation is a procedure regulating stoma function and providing psychical comfort due to the control of defecation; in addition, it limits the amount of passed gas and unpleasant smell as well as prevents dermatological complication and thus improves the quality of the patient’s life. This procedure may be recommended to patients with colostomy unless contraindications to irrigation (e.g. stoma stenosis) are present (5).

Despite adherence to current standards of stoma care and appropriate operation techniques, stoma complications cannot be prevented completely. The need to select a proper location of the stoma prior to the surgery is of special importance. Such an approach makes it possible to reduce significantly the rate of postoperative stoma complications. At present, we have very good stoma equipment, continuously improved by the manufacturers, at our disposal. In addition, various stoma care products are available, including those dedicated for complicated, “difficult” ileostomies and colostomies. All stoma complications observed in our patients were successfully treated using conservative methods, without a need for surgical correction.

**SUMMARY**

Guiding the patient through a difficult and sometimes prolonged process of healing of a “difficult” stoma until the patient is able to care properly and independently for their stoma requires experience, knowledge, and
creativity of the therapeutic team as well as the availability of stoma equipment and products for adequate skin care and wound healing. In this paper, we proposed methods of conservative treatment and management of “difficult” ileostomies and colostomies, utilising possibilities offered by modern stoma equipment and stoma care products, in eight patients treated at our department. In all patients peristomal lesions eventually healed or a significant progression of healing was observed. The patient’s general condition often precludes repair surgery, even if surgical correction of the stoma is technically possible. The need of effective cooperation between the stoma nurse and the physician in integrated management of patients with a complicated stoma must be stressed.

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