Familial polyposis syndromes create a group of hereditary syndromes of gastrointestinal tumours. We shall focus on those, touching mostly large bowels and need radical surgery.

Key words: polyposis syndromes, colon, surgery

INTRODUCTION

A gastrointestinal (GI) polyp is defined as a mass of the mucosal surface, protruding into the lumen of the bowel. Polyps can be neoplastic, non-neoplastic or submucosal. Multiple polyps within GI tract characterise GI polyposis.

A variety of polyposis syndromes can affect gastrointestinal tract (GIT). The familial polyposis syndromes can be classified as familial inherited (autosomal dominant) or nonfamilial.

The inherited polyposis syndromes can be further subdivided into 2 groups depending on whether the polyps are adenomas or hamartomas. The adenomatous polyposis syndromes include the classic familial adenomatous polyposis (FAP), Gardners syndrome and Turcot syndrome. Hamartomatous familial polyposis syndromes include Peutz-Jeghers syndrome, juvenile polyposis syndrome, Cowdens disease and Ruval-Caba-Myhre-Smith syndrome.

The non-inherited polyposis syndromes include Cronkhite-Canada syndrome and a variety of miscellaneous non-familial polyposis.

From a prognostic viewpoint, these syndromes must be recognized, because the adenomatous polyps are premalignant. These syndromes should be considered when an intestinal polyp is recognized in the young, when 2 or more polyps are seen in any patient, when colic carcinoma is discovered in patients younger than 40 years and when extraintestinal manifestations associated with these syndromes are discovered.

GI polyps may be asymptomatic, but may also occur with rectal bleeding and diarrhoea. The urgency of case tracing and genetic counselling is related not so much to the symptoms of the disease but to the potential for the development of a colic carcinoma. It is probable that patients with FAP, if untreated, will develop a colic carcinoma.

FAP is also known as familial polyposis coli. The polyps are adenomatous and occur primarily in the colon. The carcinoma occur mostly in the left colon and are often multiple. It is also possible, however, of polyps, adenomas and carcinomas to grow in the stomach, duodenum and small intestine. Connected with extraintestinal manifestation, we call it Gardner syndrome. The manifestations include: osteomas, jaw cysts, dental anomalies, brain tumours, other skin and soft tissues tumours and congenital hypertrophy of the retinal pigmentary epithelium.

FAP shows autosomal dominant transmission. The frequency is 1 in 8300 to 13500 births. In Denmark, new mutations account for 25% of cases. The average age at the time of diagnosis of polyps is 35 years. The average age of cancer diagnosis is 39 years. About 50% of symptomatic and 10% of asymptomatic patients have carcinoma of the colon at the time of diagnosis. Carcinoma may be present in all cases by the age of 50 years. Penetrance is nearly completed by age 40 years.

Gardner syndrome was originally described in individuals with FAP-like polyps who had additional findings outside of the gastrointestinal tract (GIT), including epidermal cysts and subcutaneous fibromas of the skin, desmoids of the skin and abdomen, osteomas, dental abnormalities, pigmented patches in the retina and tumours of other organs.

Gardner syndrome includes a range of varieties of manifestations.
Soft-tissue tumours:
epidermoid inclusion cysts of the skin
dermoid tumours
fibromas
lipomas
lipofibromas
neurofibromas
leiomyomas
mammary fibromatosis
intra-abdominal desmoid tumours and peritoneal fibromas

GI tumours
colonic polyposis (nearly 100% precancerosis)
gastric adenomatous polyps
gastric hamartomatous polyps
duodenal adenomatous polyps
periampullary carcinoma
hepatoblastoma
pancreatic carcinoma
lymphoide hyperplasia of the terminal ileum

Osteous abnormalities
usually involving the membraneous bones, mandible,
calvarium, maxilla, ribs and long bones
self-limited benign exostosis
bone islands and periostal thickening

Endocrine tumours
thyroid carcinoma (papillary)
carcinoid tumours of small bowel
parathyroid adenoma
adrenal adenoma-carcinoma
pituitary chromophobe adenoma

Central nervous system medulloblastoma

Abnormal dentition
supernumerary teeth
impacted teeth
odontoma
hypercementosis
teeth more prone to carries

The distinction between Gardner syndrome and FAP was unclear, however, because some individuals diagnosed with FAP also had extraintestinal signs. Clinical Gardners syndrome and FAP can occur in the same kindred. It was subsequently found that both conditions could result from the same mutation in the APC gene. Thus, Gardner syndrome and FAP are allelic and both are attributable to mutations in the APC gene. (Many genes show alterations in GIT neoplasia that does not, as yet, have an immunohistochemically detectable protein product. These genes include the APC – adenomatous polyposis coli and the MCC – mutated in colon cancer genes.)

Other hereditary syndromes of GI tumours:

Turcot syndrome

Turcot first described an association between colic polyps and tumours. Turcot syndrome is characterized by the presence of malignant brain tumour in patients with colic adenomatous polyps. Recent advances have clarified the relations between Turcot syndrome and Gardners syndrome, which may also be associated with brain tumours.

Cronkhite-Canada syndrome

This syndrome includes generalized GI polyposis in association with neuroectodermal changes consisting of alopecia, hyperpigmentation and atrophy of nails. Electron microscopic studies of the skin reveal increased numbers of melanin granules in keratocytes, increased number of melanosomes in melanocytes, increased melanocyte numbers, compact hyperkeratosis, perivascular inflammation and exocytosis. A number of hematologic, neurologic and metabolic abnormalities are associated with Cronkhite-Canada syndrome.

Attenuated FAP

This is a less severe form of polyposis with a low number of polyps (adenomas), usually less than 100, yet patients sustain a high risk for colorectal cancer. The cancers usually develop 15 years than the classic FAP patient, but 10 years earlier than sporadic cancer.

Hamartomatous polyposis

The polyps in both Peutz-Jeghers syndrome (PJS) and familial juvenile polyposis are hamartomatous, but the major tissue components are different. The Peutz-Jeghers polyp is composed of intestinal crypts and villi and smooth muscle bundles in a disorganized fashion. Inflammatory cells are absent or scanty and the glandular structures are not excessively dilated. The juvenile polyp is composed of diluted intestinal glands and abundant connective tissue of the lamina propria. Smooth muscle elements are usually absent, the lymphoid cells are common. These features closely resemble those of inflammatory retention polyps in children, also known as juvenile polyps, as well as inflammatory polyps of Cronkhite-Canada syndrome, which occurs among the elderly.

Peutz-Jeghers syndrome is characterized by the presence of Peutz-Jeghers polyps throughout the entire GIT and melanin spots on the lip (96%), buccal mucosa (83%), face (36%) and extremities (32%). Small bowel is the favoured site of the polyposis and the number of polyps is small. Other associated abnormalities include polyps in the urinary bladder and nasal cavity, bone deformities congenital heart disease and retarded development.

The symptoms of Peutz-Jeghers syndrome develop before the age 20 year in two-thirds of cases with an average age at time of diagnosis of 22 years. The symptoms of FJS are noted at a younger age than those associated with FAP. Peutz-Jeghers polyps are generally not prone to malignant change. However, carcinoma of GIT has been reported in about 3% of cases, most commonly in the proximal small intestine. In many reports, the relationship between polyp and carcinoma is unclear. When the origin of malignancy was carefully studied, the carci-
nomata was usually found to arise in the adenomatous or dysplastic epithelium in the polyp. Malignancy can also occur outside of the GIT. The condition is linked to 19p chromosomes in at least some families.

**Discrete adenomas and carcinomas of the colon**

Whereas polyposis syndromes are rare, discrete adenomas in small numbers occur in from 10% to 50% of the general population. Overall, colorectal cancer may affect 3% of the population. The inheritance pattern of these cases is largely unknown. Park studied a large inderred with clusters of colorectal cancer. Extensive screening with flexible proctosigmoidoscopy revealed adenomas in 21% of the 191 pedigree members in constras to 9% of controls. The excess of adenomas showed autosomal dominant inheritance. A subsequent expanded study of 670 persons in 34 kindreds revealed the estimated prevalence of adenoma at age 60 years in related family members was 24%, whereas that in unrelated spouses was 12%. Such studies emphasize the importance of screening for colorectal tumours in first-degree relatives of patients with these lesions.

**Hereditary flat adenoma syndrome**

Hereditary flat adenoma syndrome (HFAS) is presently thought to be a variant of FAP with the genetic defect linked to 5q21-22. Signs of HFAS in individuals are:

1. multiple colorectal adenomas, but usually fewer than 100
2. the polyps tend to occur at a later age than in classic FAP
3. the adenomas tend to show a proximal location
4. the onset of colorectal cancer is later than in HNPCC and FAP
5. these individuals have adenomas and cancers of the stomach and duodenum and
6. fundic gland polyps of the stomach are also noted

In some patients fundic may be present in the absence of colorectal adenomas. Lynch stressed that only about 1% of such adenomas has high grade dysplasia, which is much lower than reported in patients with sporadic flat adenoma.

**Muir Torre syndrome**

The Muir Torre syndrome was originally subclassified as a form of hereditary adenomatous polyposis syndrome (FAP). The Muir Torre syndrome is a rare autosomal dominant disorder with fewer than 100 adenomas, typically present in the proximal colon. This syndrome is associated with skin lesions such as basal cell carcinoma, sebaceous carcinoma and squamous carcinoma. The genetics of this syndrome is unknown yet.

**Cowdens disease**

Cowdens disease is an uncommon autosomal-dominant disorder. Cowden is the family name of original report patient, Rachel Cowden. This syndrome is a rare disorder that is inherited in autosomal dominant manner with inter-familial and interfamilial differences in the expressively of symptoms. In Cowdens disease one sees facial trichilemmomas, acral keratosis and oral mucosal papilomas. This disorder is also associated with breast and thyroid cancer. There are numerous colic and small-intestinal polyps. They have been described as hamartomatous lesion, consisting middle fibrotic, middle disordered mucosa overlying a submucosa that displayed disorganization and splaying of smooth muscle fibres.

These lesions show some similarities to the pathology seen in the solitary rectal ulcer syndrome. Other authors reported polyps that were described as inflammatory lesions, lipomas and ganglioneuromas. There is no increased risk for gastrogintestinal cancers in this disorder.

**Ruval-Caba-Myhre-Smith syndrome**

Ruval-Caba-Myhre-Smith syndrome is inherited in autosomal dominant manner. There are some sporadic cases, too. The syndrome is characterised by macrocephaly, pigmented genital lesions, subcutaneous and visceral lipomas, hemangiomatous polyps. mesodermal hamartomas can affect the subcutaneous, intracranial, visceral, intestinal, thoracic and osseous tissues. Hydrocephalus and diffuse thickening of the corpus callosum have also been reported.

**Intestinal ganglioneuromatosis**

Intestinal ganglioneuromatosis is a familial disorder that has been associated with multiple endocrine neoplasia syndromes, type 2b and with the Recklinghausens disease. There may be a diffuse proliferation of ganglioneuromatous elements, which at times may be polypoid. In some instances, the ganglioneuromatosis has been found in association with juvenile polyposis and adenomas.

**Lymphoid polyposis**

Multiple benign lymphoid polyposis of the large bowel has been reported. Most cases occur in children. Histologically similar to the solitary lymphoid polyps of the rectum, lymphoid polyposis consists of prominent active lymphoid nodule in the mucosa and submucosal. The lesions are entirely benign and in some cases have been reported to disappear spontaneously. In patients with family histories of polyps it is essential to determine the exact histologic nature of the lesions so that unnecessary surgery is not performed. Benign lymphoid polyposis of the terminal ileum has been reported in patients with Gardner's syndrome and FAP.

**Hereditary mixed polyposis syndrome**

This is an autosomal dominant disorder that has been mapped to chromosome 6q. Five types of polyps have been described in individuals with this disorder.

- tubular adenomas
- vilous adenomas
- flat adenomas
- hyperplastic polyps
- typical juvenile polyps
Colorectal cancer is also seen in this disorder. This disorder might be a variant of juvenile polyposis (JP). But in JP adenomas are uncommon (2%), while in hereditary mixed polyposis the number of polyps is less than seen in juvenile polyposis\textsuperscript{19}. JP usually presents one decade earlier than hereditary mixed polyposis.

**Non surgical treatment of FAP**

There are reports\textsuperscript{20} trying to treat FAP without operation. Even the authors reported the decrease of number of the polyps to 44% at a size to 35% by means of Sulindac (sulfoxide NSAID) in 18 patients, this method could not replace colectomy.

**Surgical treatment of FAP**

As FAP is 100% precancerosis, colectomy is recommended. Treatment of FAP is influenced by the natural history of the disease, which is variable. If patients are left long enough without colectomy, they will all develop carcinoma. The sooner is patient diagnosed, the better prognosis he could have, if colectomy is made.

We have 3 possibilities of surgical treatment. Each of them has its pros and cons:
- total colectomy with permanent ileostomy (in cases of malignancy in low rectum)
- total colectomy with ileoanal anastomosis (poor functional results)
- subtotal colectomy with ileorectal anastomosis (poor functional results, but risk of recurrence in the rectal stump)

The procedure of choice for FAP is the subject of much debate at present, particularly since restorative proctocolectomy became feasible\textsuperscript{21}. The other options are colectomy and ileorectal anastomosis, proctocolectomy or colectomy and rectal mucosectomy but without restoration of GI continuity.

Conventional panproctocolectomy has the advantage of eliminating all colorectal polyps and virtually eliminating the risk of carcinoma of large bowel. This operation does not protect against ampullary or small bowel malignancy. In addition there is a burden of an ileostomy in a condition where 50% of family members are at risk of disease and the patient is exposed to the small risk of pelvic nerve damage with resulting bladder and sexual problems. Also there is a perineal wound, which although less likely to break down than after proctocolectomy for inflammatory bowel disease, may leave the patient with a persistent sinus.

Intersphincteric excision of the rectum reduces risk of pelvic nerve injury and rectal mucosectomy eliminates problems with the perineal wound. The risk with a long rectal mucosectomy is that all the diseased mucosa may not be removed and there is then a slight risk of carcinoma developing in any remnant left behind. The overwhelming disadvantage, however, of any procedure that leaves behind a permanent ileostomy is that it is a poor advertisement of treatment for other members of the family. Although a patient with an ileostomy can lead a full and active life, it is hard to convince a young and active family member, who may well be asymptomatic, to undergo such a procedure. It is for this reasons that sphincter saving procedures such as colectomy with ileorectal anastomosis or restorative proctocolectomy have become popular\textsuperscript{22}.

The procedure of colectomy and ileorectal anastomosis has the advantage that gastrointestinal continuity is restored and bowel function is reasonable. Its disadvantage is that polyps are left in the rectum with the potential of malignant change. To prevent this unfortunate outcome the patient needs to have repeated fulguration of residual or newly formed polyps\textsuperscript{23}. Not only can this procedure be uncomfortable, it also requires the patient to return repeatedly for rectoscopic examination. In addition, although it would seem logical, if the adenoma-carcinoma sequence is accepted, that removal of polyps removes the risk of carcinoma, this does not necessarily follow. There is evidence to suggest that carcinoma can develop de novo in rectal mucosa not occupied by polyps.

The operation of mucosal proctectomy and pelvic ileal reservoir, now generally termed restorative proctocolectomy, has the theoretical advantage that the disease is eradicated, the gastrointestinal continuity is restored and continence is maintained. It appears, unfortunately, from some of the results reported so far, that bowel function is not always satisfactory as after ileorectal anastomosis. However, these results have in the main been described in patients who have suffered from ulcerative colitis. There is now substantial evidence both from our own experience and from others that the clinical results of restorative proctocolectomy for polyposis are far superior to those reported in patients with colitis.

Nevertheless, restorative proctocolectomy is a complex procedure and although mortality is very low, morbidity can be high. Although results are steadily improving, the procedure is still developing and the long term results in FAP are unknown. Maybe due to small numbers of patients, further modifications may be desirable before it can be categorically accepted as the operation of first choice for all patients with FAP.

The conventional policy in many units dealing with these patients is still to perform a colectomy and ileorectal anastomosis in the first instance, provided patients are likely to be reliable in attending for follow-up. Follow-up at regular 6 months intervals is usually necessary so that rectal polyps if present can be destroyed by fulguration. In order to determine if this is still a reasonable policy it is necessary to access the risk of developing a rectal after ileorectal anastomosis.

**Carcinoma risk after colectomy and ileorectal anastomosis**

There is a considerable controversy concerning the incidence of carcinoma following colectomy and ileorectal anastomosis. The evidence against ileorectal anastomosis came mainly from Mayo Clinic. Moertel\textsuperscript{24} found that in 145 patients treated by subtotal colectomy and ileorectal anastomosis, there was a continuing risk of rectal cancer. This was 25% after 15 years of follow up and 59% after
23 years. They found that women were at greater risk than men and that the incidence was markedly increased if the patient had a carcinoma in the resected colon. Another factor with important clinical application was that the risk of carcinoma was considerably reduced if there were fewer than 20 polyps in the rectum compared with the patients having more than 100. Some doubt has since been expressed about how many of these patients actually had a true ileorectal anastomosis. It would appear that many underwent an ileosigmoid anastomosis and it is unknown what influence the latter procedure might have had on the outcome, particularly since surveillance following this operation is more difficult than after a true ileorectal anastomosis. Fuel for the controversy was further supplied by reports from other centres. They reported a series of 89 patients treated by a true ileorectal anastomosis and 6-monthly surveillance. Included in this series were 47 patients followed for 10 years, 27 followed for 15 years and 13 followed for 20 years. Only Two patients (2.2%) developed a carcinoma, both of which were Dukes A lesions and both patients survived. There are similar reports from other centres, showing, that carcinoma develops in up to 6% of cases.

Making recommendations from these contradictory data, particularly at a time when restorative proctocolectomy is not fully tested, is clearly difficult. There is no doubt that there is a risk of developing carcinoma after colectomy and ileorectal anastomosis, which relates to the number of polyps in the rectum ant the presence of coexisting carcinoma. This may also be related to how much colorectum remains. There may be geographic differences. Consequently there has been general unease about performing colectomy and ileorectal anastomosis in various countries.

Present surgical policy

At present, the policy in the world is variable. Most surgeons still seem content to treat their patients with colectomy and ileorectal anastomosis followed by regular surveillance. An increasing proportion, on the other hand are performing restorative proctocolectomy in most of their patients and certainly on those with severe rectal polyposis. A more rational policy perhaps is the compromise advocated by some surgeons. If the number of polyps within 15cm from the anal verge is less than 20, we perform a colectomy and ileorectal anastomosis. Restorative proctocolectomy is used for patients with more than 100 rectal polyps. Patients with 20-100 polyps are treated by colectomy and ileorectal anastomosis if the minimum time off school is desirable or if the patient can be relied upon to attend for follow-up. All others in this intermediate group are advised to have a pouch. As the morbidity of restorative proctocolectomy falls and more centres gain expertise, we are sure that it will become the operation of first choice for all patients with the disease. Until then, the operative treatment is likely to be governed by each surgeon’s beliefs and experience coupled with the patient’s attitude to attending for 6-monthly rectoscopy as well as the views of the patient’s family.

In general, there are three options available to the surgeon seeking to prevent patients with FAP from dying of colorectal cancer:

- Proctocolectomy with ileostomy
- Colectomy with ileorectal anastomosis
- Proctocolectomy with ileoanal reservoir.

The choice of operation should be based on clinical knowledge of the disease process and the fact that prophylactic colectomy does not necessarily cure the condition. Other considerations involve the patient’s age and anatomy, the presence or absence of extracolonic manifestations and the expertise of the surgeon. Over the years, debate has centered on the value of proctocolectomy and ileostomy with colectomy and ileorectal anastomosis. This debate was further compounded by the development of the ileal reservoir procedure. Today it seems obvious that proctocolectomy and ileostomy should rarely be necessary for patients with FAP and the polyposis syndrome. Therefore, the debate now centres on the value of ileorectal anastomosis versus proctocolectomy with ileoanal reservoir or restorative proctocolectomy.

It is up to surgeon and the institution, if the approach will be traditional (open surgery), laparoscopically assisted, hand assisted or completely laparoscopic. Recently, many authors refer about good experiences with laparoscopic approach. It could be safe and effective treatment for selected patients with FAP. As techniques and instrumentation for laparoscopic colon surgery are perfected, this procedure will likely become an appealing option in the management of patients with FAP.

Technique of colectomy and colorectal anastomosis.

This method seems recently mostly accepted.

The major concern with colectomy and ileorectal anastomosis as a prophylactic surgical option in patients with FAP is the subsequent risk of rectal cancer. It was easier to recommend ileorectal anastomosis to patients and many surgeons prefer this option also after the advent of the ileoanal reservoir. The actual documented risk of dying of cancer of the rectum subsequent to colectomy and ileorectal anastomosis is somewhat small. The risk of developing polyps and the risk of developing cancer, are, of course, higher. It would appear that proctoscopic surveillance and ablation of polyps that arise in the rectal segment are possible, but this does not eliminate fully risk of rectal cancer. Long term follow-up studies demonstrate that development of cancer does not always equate with death from that cancer. Ileorectal anastomosis is compatible with good functional results. It is a simpler procedure than the ileoanal reservoir and it is usually a one-stage procedure, as opposed to the two-stage procedure commonly used to construct an ileoanal reservoir. More recent improvements in surgical technique and skill have suggested that a one-stage ileoanal reservoir without temporary ileostomy would be an appropriate option. The refinements in technique achieved in recent years have improved the functional results and decreased the surgical complications of proctocolectomy and ileoanal reservoir.
The ability to perform the operation as a one-stage procedure makes it an appropriated option as a contemporary alternative to ileorectal anastomosis. To support use of IRA, there are results of studies of quality of lives (QoL). The authors argue that there were no differences with respect to health status between patients in groups of IRA and IAA and preference for either procedure cannot be based on QoL.

Rectal stump control after subtotal colectomy and ileorectal anastomosis

It is advised to make a rectoscopy every 6 months and eventually remove the remnants of polyps by means of laser, fulguration, and photoagulation or by means of transanal microsurgery. Lifetime surveillance of the rectal stump is crucial, as showed in authors from Ankara. They report a local recurrence 19 years after ileorectal anastomosis.

There are some optimistic reports, referring, that colectomy with ileorectal anastomosis in FAP is associated with a significant reduction in rectal mucosal cell proliferation. These findings claim of reduced risk of rectal cancer following this procedure in FAP and are of relevance to study of environmental vs. genetic control of cell proliferation.

CONCLUSION

FAP and other polyposis syndromes are generalised disorders with ramifications throughout the body. Early diagnosis by recognition of at-risk individuals and proctoscopic surveillance is important in prevention cancer. Surgical options now available can eliminate the risk of colorectal cancer and provide a good functional outcome without a permanent ileostomy. Ongoing surveillance programmes are important because there is still a risk of dying of extracolic manifestations of the disorder. Prophylactic colectomy of whatever type does not predict total cure of the disease. Two most frequent procedures (ileorectal and ileoanal anastomosis) have been evaluated. The long-term survival following either approach is similar: 87% for ileorectal anastomosis and 83% for ileoanal anastomosis.

Management of these families is best accomplished within the framework of a familial polyposis registry. In Czech Republic, there are more than 80 families registered. This allows for better communication with individual patients and family members, for identification of those at risk and for education of family members. These family members must be encouraged to undergo surveillance examinations so that the condition can be diagnosed early and surgical intervention can prevent the development of colorectal cancer. Interesting developments in the management of desmoids with medical agents should be further pursued in a prospective fashion in an effort to determine their true role in the management of the condition. The potential of similar therapeutic agents, such as Sundilac, to promote the regression of colic polyps has been suggested and requires further prospective investigation. Sundilac suppositories for patients with polyps in rectal stump after ileorectal anastomosis also show some promise. Whether the disappearance of polyps with the use of Sundilac eliminates the risk of developing cancer or simply eliminates the polyps is still undetermined.

There is also uncertainty regarding the management of upper gastrointestinal polyps in FAP. Further investigation into the local factors that dictate the development of adenomas in the duodenum and the polyp-cancer sequence in this area is necessary. The effect of bile on that sequence of events remains an important area for further research. The possibility of medical management of GI polyps is obviously attractive and there are some ongoing studies that are seeking to determine whether medical agents can influence the development of upper GI polyps in FAP patients. It is hoped that further research into the chromosomal abnormality and a distinct blood tests for this disease are truly forthcoming because these could eliminate the problem of the unavailability of blood samples from other family members. The growth in the number of familial polyposis registries and the addition of increasing numbers of patients to them are certainly helpful for patients and their families and their physicians. The registries give researchers more long-term follow-up information on the clinical manifestations of the disease and on the results of medical and surgical treatment.

SUMMARY

SINDROM POLIPA KOLONA INDIKACIJE ZA OPERACIJU

Sindromi familiarne polipoze čine grupu naslednih sindroma gastrointestinalnih tumora. Mi čemo se skoncentrirati na one koji imaju veze sa kolonom i zahtevaju radijalnu operaciju.

Ključne reči: sindrom polipa, kolon, hirurgija

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