LARGE COLORECTAL POLYPS – ENDOSCOPIC POLYPECTOMY AS AN ALTERNATIVE TO SURGERY

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Endoscopic polypectomy of colorectal polyps is a common procedure. However, endoscopic treatment of large polyps (those with a diameter exceeding 2 cm) remains questionable. There is a serious risk of colorectal carcinoma presence inside these lesions, which eventually would require surgical intervention. Apart from this fact endoscopic polypectomy of large polyps is connected with substantial risk of complications, such as perforation and bleeding. Many patients with large colorectal polyps are qualified for surgical intervention.

The aim of the study was to determine the efficacy and safety of polypectomy of large colorectal polyps.

Material and methods. The study presented results of endoscopic treatment in case of patients with large colorectal polyps at the Department of General and Colorectal Surgery, Medical University in Łódź. Patients were admitted to the hospital during the period between January, 2008 and January, 2010. The following parameters were analysed: location of polyps, percentage of high grade dysplasia, complete excision rate, and complications connected with polypectomy procedures.

Results. During the analyzed period of time 488 endoscopic polypectomies were performed. Forty-three large colorectal polyps were removed (8.8%). Seven (16.3%) of them were classified as flat polyps. Out of 488 removed polyps, 39 were classified as adenomas with high grade dysplasia (7.9%), while 16 were large-exceeding 2 cm (37.2%). Considering the group of large polyps no invasive carcinoma case was detected. The radical excision rate for large pedunculated polyps was obtained in 88.8% (32/36) of cases. In case of flat adenomas the above-mentioned parameter was lower – 57.1% (4/7). During polypectomy of large colorectal polyps one perforation was observed during the excision of a flat cecal polyp. In two cases immediate bleeding occurred (2/43). In both cases endoscopic treatment of bleeding proved sufficient.

Conclusions. Endoscopic polypectomy of large pedunculated polyps is a safe and efficient method, which makes it a rationale alternative for surgery. Polypectomy of flat adenomas is connected with a lower radical excision rate and higher risk of perforation.

Key words: colorectal polyps, endoscopic polypectomy, flat adenomas, surgery

Colorectal polyps are one of the most common pathological structures observed during endoscopy of the gastrointestinal tract. Depending on the histological type polyps may be divided into the following groups: adenomas, adenocarcinomas, and benign polyps (1). Depending on the histological structure adenomatous polyps may be divided into villous, tubular, and villotubular polyps. Villous adenomas are usually larger, do not have a peduncle, and are often subject to malignant transformation. Hyperplastic polyps are the most common benign lesions (2). The above-mentioned are most commonly found in the rectum, their diameter rarely exceeding 5 mm. The endoscopic picture of these lesions does not allow too distinguish them from small adenomas. Diagnosis is thus based on the
histopathological examination of the excised specimen. Other benign polyps include juvenile polyps-hamartomas, which are large in size, and inflammatory polyps, characteristic of ulcerative colitis (1).

Lipomas are another significant group of polyps (3). They are most often localized in the proximal segment of the colon, being smooth, with the possibility of attaining large diameters. Contrary to other polyps they should not be excised. In case of lipoma polypectomy there is high risk of intestinal wall scalding leading towards perforation. Additionally, one may observe a significantly more common occurrence of massive bleeding following polypectomy. In case of diagnostic doubts mucous membrane samples should be collected for histopathological verification (3). Polypectomy is the basic therapeutic procedure performed during lower gastrointestinal tract endoscopy. With the development of endoscopic techniques questions arise concerning the limitations of the method and indications for surgical intervention in case of colonoscopic diagnosis of polyps. Large lesions (exceeding 2 cm in diameter) and polyps with confirmed significant dysplasia might pose doubts (4, 5). The study presented our own experience considering polypectomy of large colorectal polyps. Particular emphasis was placed on the safety of the procedure, characteristics of polyps with high-grade dysplasia, and percentage of radical polypectomies.

The aim of the study was to determine the efficacy and safety of polypectomy of large colorectal polyps.

MATERIAL AND METHODS

During the period between January, 2008 and January, 2010, 488 polypectomies were performed during colonoscopy at the Department of General and Colorectal Surgery. The endoscopic procedures were performed by five experienced physicians. Each of the endoscopists performed about 250 procedures every year. The histopathological samples were evaluated by two experienced pathomorphologists. All endoscopic polypectomy examination protocols and histopathological results were subject to retrospective analysis. Polyps exceeding 20 mm were considered as large lesions. In case of pedunculated lesions exceeding 20 mm the peduncle and head of the polyp were subject to 2-4 ml adrenalin solution injections (1:10000-dilution). Flat lesion polypectomy was performed by means of the „snare” method after physiological saline injections of the base of the peduncle. The following parameters were analysed: number, location and morphology of the excised large polyps, percentage of high-grade dysplasia, radical surgery in case of large polypectomies and high-grade dysplasia lesions, as well as polypectomy complications.

RESULTS

During the analysed period, 488 polypectomies were performed: 43 polyps were considered as large (exceeding 20 mm), which accounted for 8.8% of the removed polyps. The average size of large polyps was 26 mm. Most of the removed polyps were located in the distal colorectal segment. Thirteen (30.2%) were removed from the rectum, 23 (53.5%) from the sigmoid colon, and three (7.1%) from the descending colon. One (2.3%) polyp was removed from the transverse colon, while the remaining three (7%) from the ascending colon and cecum. Seven (16.3%) polyps were considered as flat lesions. The above-mentioned were removed by means of the “snare” method after physiological saline injections. Forty-one of the removed large adenomas were considered as adenomas (95.3%). In two cases benign polyps were excised: a 25 mm cecal polyp which proved to be an inflammatory lesion and a 30 mm rectal polyp, which was diagnosed as a hyperplastic lesion. Considering the analysed material, benign lesion malignancy was not observed. Table 1 presented data concerning the location and average diameter of the removed polyps.

Twenty-five of the 41 (60.9%) removed large adenomas were characterized by low-grade dysplasia. The remaining 16 (39.1%) were diagnosed with high-grade dysplasia. Thirty-nine of the removed 488 polyps were considered as high-grade dysplasia, which accounted for 7.9% of all removed adenomas. The average size of polyps diagnosed with high-grade dysplasia was 17.74 mm (SD = 10.46 mm). The smallest polyp was 2 mm in diameter, being located in the sigmoid. Considering the 43 large polyps, 16 were characterized by high-grade dysplasia, which accounted for 37% of all lesions. In case of polyps smaller than 20 mm the percentage of adenomas with high-
grade dysplasia was 5.2% (tab. 2). In case of large, flat polyps, four (57%) of the seven removed lesions, were diagnosed with high-grade dysplasia. In case of pedunculated lesions the above-mentioned percentage was lower 33%.

In three cases of polypectomies of large polyps subtotal adenoma removal was observed. Two cases concerned rectal flat polyps removed by means of the „snare” method. The lesions were 25 and 35 mm in size. In both cases total removal of the adenoma was not possible. Due to severe inflammation at the site of the removed polyp we decided not to remove the rest of the lesion. These patients were qualified for colonoscopy after three months. The histopathological result of the removed polyps showed villous adenomas with high-grade dysplasia. Examinations performed after three months showed significant progression. Patients were qualified for transanal endoscopic microsurgery (TEM). The third case concerned the incomplete excision of a pedunculated sigmoid polyp, 25 mm in diameter, villous adenoma with low-grade dysplasia. The patient was redirected for colonoscopy, where at the site of the polypectomy we observed normal scar tissue. The histopathological examination showed no adenoma cell presence. The patient remained under endoscopic control. In two cases, due to thermal histopathological damage the radicality of polypectomy was not determined. The above-mentioned concerned patients with a squat rectal polyp (25 mm in diameter), and a flat transverse colon polyp (20 mm in diameter). In both cases low-grade dysplasia adenomas were diagnosed. The second colonoscopy confirmed no rectal adenoma recurrence. Considering the patient with a transverse colon polyp, incomplete excision was confirmed. Due to the large size of the lesion endoscopic polypectomy was not performed. The patient was qualified for surgery. Right-sided hemicolectomy was performed. The postoperative course proved uneventful. The patient was discharged from the hospital seven days after the procedure. The histopathological examination result showed the presence of a 4 cm villous adenoma with high-grade dysplasia. The percentage of confirmed radical polypectomies considering large polyps was 88%. In case of flat polyps the above-mentioned amounted to 57% (tab. 3).

In case of the 488 polypectomies performed during two years surgical intervention was required in two patients. In both cases intestinal perforation was the culprit. In the first case, perforation occurred during the removal of a small sigmoid polyp (3 mm in diameter) by means of thermal biopsy. Perforation was diagnosed on the second day after the polypectomy. The patient was qualified for surgery—sigmoid resection with simultaneous colostomy. The postoperative course proved uneventful. The patient was discharged from the hospital in good general condition eight days after surgery. In the second case, perfora-

### Table 1. Location and size of the removed large colorectal polyps, considering the analysed material

<table>
<thead>
<tr>
<th>Location</th>
<th>Number of polyps (%)</th>
<th>Flat polyps</th>
<th>Median of the diameter of the polyp (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rectum</td>
<td>13 (30,2)</td>
<td>3 (23,1%)</td>
<td>25; SD 7</td>
</tr>
<tr>
<td>Sigmoid</td>
<td>23 (53,5)</td>
<td></td>
<td>25; SD 4,4</td>
</tr>
<tr>
<td>Descending colon</td>
<td>3 (7,1)</td>
<td></td>
<td>20; SD 9,4</td>
</tr>
<tr>
<td>Tranverse colon</td>
<td>1 (2,3)</td>
<td>1 (100%)</td>
<td>20</td>
</tr>
<tr>
<td>Ascending colon</td>
<td>1 (2,3)</td>
<td>1 (100%)</td>
<td>30</td>
</tr>
<tr>
<td>Cecum</td>
<td>2 (4,6)</td>
<td>2 (100%)</td>
<td>27,5; SD 2,5</td>
</tr>
<tr>
<td>Total</td>
<td>43</td>
<td>7 (16,3%)</td>
<td>25; SD 5,79</td>
</tr>
</tbody>
</table>

SD – standard deviation

### Table 2. Number of polyps and percentage of adenomas with high-grade dysplasia considering polyps <20 mm and large colorectal polyps

<table>
<thead>
<tr>
<th>Polyp diameter (mm)</th>
<th>Total</th>
<th>High-grade dysplasia (n)</th>
<th>High-grade dysplasia (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20</td>
<td>445</td>
<td>23</td>
<td>5,2</td>
</tr>
<tr>
<td>≥20</td>
<td>43</td>
<td>16</td>
<td>37,2</td>
</tr>
</tbody>
</table>
tion was observed on the day of the polypec-
tomy (30 mm flat cecal polyp). The patient was
subject to right-sided hemicolectomy with
ileocolostomy. The postoperative period proved
uneventful. The patient was discharged from
the hospital in good general condition on the
ninth day after surgery. The perforation rate
in the analysed material amounted 0.2%, while
in case of large polyps – 2%.

In two cases of polypectomy of peduncu-
lated sigmoid polyps bleeding was observed.
Bleeding was controlled by means of clipping
of the peduncle of the removed polyp. Delayed
hemorrhage was not observed. Table 4 pre-
sented complication statistics.

**DISCUSSION**

The study presented polypectomy results
considering patients with large colorectal pol-
yps. Polyps were divided depending on their
size (>2 cm). In case of the 43 removed large
polyps during colonoscopy, seven were flat le-
sions. Their excision is connected with in-
creased risk of complications, such as perfora-
tion and bleeding, and thus, subtotal polypec-
tomy. Additionally, these lesions are more
often diagnosed with high-grade dysplasia or
invasive carcinoma (4). We confirmed the
above-mentioned in our study. Fifty-seven
percent of flat lesions removed during colonos-
copy presented high-grade dysplasia, while in
case of pedunculated polyps – 33%. Adenocar-
cinoma presence was not observed in the ex-
cised polyps. The radical polypectomy rate in
case of flat polyps was lower, as compared to
pedunculated polyps (57% and 88%, respec-
tively). The only case of perforation during
large polyp polypectomy was observed in the
above-mentioned group. Thus, flat polyp
polypectomies are rarely performed in our
Department. In case of non-pedunculated rec-
tal polyps without an invasive carcinoma
component, patients are routinely qualified for
Transanal Endoscopic Microsurgery (TEM). In
case of proximal colon lesions patients are
more often qualified towards surgery, as com-
pared to pedunculated polyps. A similar strat-
egy was also preferred in other surgical cen-
ters. Onken et al. analysed different therapeu-
tic methods considering 280 patients diagnosed
with flat polyps. Data was obtained from Duke
University Hospital during the period between
1997 and 2000. 41 polyps exceeded 2 cm in
diameter. Sixty percent of the above-mentioned
patients were subject to surgical management.
Treatment of flat polyps exceeding 2 cm gener-
ated more than 50% of all costs (5). Bernard
et al. presented similar results (6). The above-
mentioned authors retrospectively analysed
treatment methods of 118 patients with col-
orectal polyps. In case of patients with flat
polyps 45.2% were subject to surgical treat-
ment, as compared to 14.6% with peduncu-
lated polyps. Patients with right-sided location
polyps were also more often qualified for sur-
gery (41.9% vs 17.2%). According to the
American Society for Gastrointestinal Endos-
copy (ASGE) guidelines, pedunculated colorec-
tal polyps should be removed by means of
endoscopy, regardless their size, and whose
image does not raise suspicion of malignancy.
In case of withdrawal from polypectomy pa-
tients should be referred to reference endo-
scopic centers. In case of non-pedunculated
polyps exceeding 2 cm, surgery is often re-
quired (7). The most common complications
connected with colonoscopy and polypectomy
include hemorrhage and perforation (8). Bleed-
ing may occur during the removal of the polyp,
as well as several days, thereafter. The rate of
early and delayed bleeding amounted to 1.5
and 2%, respectively (9). The risk of bleeding
increases to 20% in case of large polyp re-
moval and mucosectomy (10). Considering the
presented material the risk of early bleeding
in case of large polyps amounted to 5%. The
bleeding was controlled by means of endoscopy.
Patients did not require blood transfusions.

### Table 3. Number and percentage of radical polypectomies in case of large polyps, considering flat and pedunculated lesions

<table>
<thead>
<tr>
<th></th>
<th>Radical surgery</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Pedunculated polyps</td>
<td>32/36</td>
<td>88,8</td>
</tr>
<tr>
<td>Flat polyps</td>
<td>4/7</td>
<td>57,1</td>
</tr>
<tr>
<td>Total</td>
<td>36/43</td>
<td>83,7</td>
</tr>
</tbody>
</table>

### Table 4. Complications after polypectomy

<table>
<thead>
<tr>
<th></th>
<th>Perforation</th>
<th>Bleeding</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Large polyps</td>
<td>1/43</td>
<td>2,3</td>
</tr>
<tr>
<td>All polypectomies</td>
<td>2/488</td>
<td>0,41</td>
</tr>
</tbody>
</table>
One day after the procedure they were discharged from the department. Delayed bleeding was not observed. The lower rate of bleeding might be connected with routine control of coagulation parameters in all patients admitted to the hospital for planned colonoscopy (APTT, INR).

Another factor influencing the reduction of the risk of bleeding during polypectomy is the routine injection of adrenalin to the peduncle and head of large polyps. The above-mentioned method has been used for years by endoscopists, in order to limit bleeding from the site of the polypectomy (11). In spite of prospective investigations demonstrating the efficacy of the method (12) it is not routinely used during polypectomy. Reed et Hogan in an article published in 2007 drew attention to the aspect connected with adrenaline injections (13). After the administration of 2-4 ml of adrenaline (1:10000) into the peduncle or head of the polyp its size is significantly decreased. The reduction might amount to even 85%. The key factor conditioning the above-mentioned effect is the few minutes interval between the injection of adrenaline and polypectomy. Encouraged by the obtained results we implemented the above-mentioned method into every day practice. Its use significantly facilitates the removal of large, pedunculated colorectal polyps.

The perforation of the colon is the most common complication connected with colonoscopy. In a large retrospective study comprising 78702 colonoscopies, Iqbal et al. observed intestinal perforation in 0.082% of patients. Forty-two percent of perforations were connected with diagnostic colonoscopies, 30% occurred during polypectomy, and 15% were connected with biopsies. The remaining perforations occurred during bleeding control, intestinal dilatation, and implementation of intestinal stents (14). Luning et al. retrospectively analysed complications connected with colonoscopy, considering a group of 30 366 patients. Gastrointestinal tract perforation was observed in 0.12% of patients (15). In a prospective study analysing factors increasing the risk of perforation during colonoscopy, Lohsiriwat et al. demonstrated that endoscopic polypectomy increases the risk of perforation three-fold, as compared to diagnostic colonoscopy. The second factor significantly increasing the above-mentioned risk was patient age, exceeding 75 years (16). Considering the analysed group of patients subject to endoscopic polypectomy perforation was observed in 0.41% of patients. In case of large polyps the above-mentioned rate increased to 2.3% (one of 43 polypectomies). It should be noted that gastrointestinal perforation was observed during flat lesion cecal polypectomy (30 mm lesion). Such polypectomies are burdened with the highest risk of perforation. During the course of pedunculated polyp excision perforation was not observed.

**CONCLUSIONS**

1. Endoscopic polypectomy of large, pedunculated colorectal polyps is a safe and effective method.
2. The high percentage of radical polypectomies and low risk of complications is connected with the fact that this method is the method of choice in case of pedunculated polyps, regardless their size.
3. In case of flat polyps removal, one may observe significantly more often the occurrence of complications requiring surgical intervention. One may also observe a lower rate of radical polypectomies. Indications for endoscopic treatment should thus be determined individually.

**REFERENCES**


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