Polyps of the gall-bladder has long been a serious diagnostic problem. Their detection in routine ultrasound is not yet satisfactory and often does not allow you to select the proper method of operating the gall-bladder.

The aim of the study was to assess the accuracy of ultrasound diagnosis of polypoid lesions of the gall-bladder through its verification by histopathology in patients treated with cholecystectomy.

Material and methods. In the years 2010-2013, 1196 patients underwent surgery due to diseases of the gall-bladder at the Department of General and Transplant Surgery, Medical University in Łódź. The study evaluated the sensitivity of ultrasound in detecting polyps of the gallbladder and histopathological findings of the formulations investigated.

Results. Preoperative ultrasound examination (USG) revealed a polypoid lesion in 64 patients; only in 29 of them (44.6%) this diagnosis was confirmed by histopathological examination. In the other cases, cholecystolithiasis or inflammatory lesions were found. The most common histopathological findings included cholesterol polyps, adenomatous polyps, and inflammatory polyps. Malignant lesions (gall-bladder cancer) were found in five patients preoperatively diagnosed with a polypoid lesion, i.e 7.8% of patients preoperatively diagnosed with a polyp and 0.4% of all patients who received surgical treatment. Patients qualified for surgery due to polyps diagnosed by means of ultrasound examination constituted 5.4% of all patients who underwent cholecystectomy. On histopathological examination, the presence of polyps was confirmed in 2.4% patients treated with excision of the gall-bladder.

Conclusions. Detection of gall-bladder polyp on ultrasound examination is an indication for cholecystectomy, in particular when the polyp diameter exceeds 10 mm. In each case of a polyp, cholecystolithiasis should also be taken into account and the presence (or absence) of indications for cholecystectomy should be discussed with the patient.

Key words: polyp, gall-bladder, ultrasound, histopathologic score

The term “polypoid gall-bladder lesion” refers to any protuberant lesion on the surface of the gall-bladder mucosa. Some polyps may undergo malignant transformation and thus pose a direct threat to the patient’s life. This threat becomes significant when the polyp diameter exceeds 10 mm (1). This applies particularly to polyps located in the gall-bladder. Adenomas arise from epithelial cells. They may be pedunculated or sessile. Polyps are seldom found in the gall-bladder and even less often in the bile ducts (2). They are most likely to develop from columnar epithelium of the gall-bladder; however, they may sometimes originate in the muscular or connective tissue. Symptoms of a polypoid lesion may be unclear or non-specific; in some cases, such lesions are asymptomatic. For this reason, they are seldom or accidentally revealed by imaging tests (3).

At present, with increased and facilitated access to diagnostic methods and imaging tests, such as classic and endoscopic ultrasonography, polypoid lesions are detected
more often (1). Visualisation of polypoid lesions is associated to a high degree with experience of the ultrasonographer and quality of the ultrasound imaging equipment. Ultrasonography remains the fundamental non-invasive method for examination of gall-bladder polyps. It is an easily available and highly efficient method for diagnostics of gall-bladder conditions; the test may be repeated without irradiation of the patient (4). A characteristic feature of polyps on ultrasound examination is strong lateral echo, without transmission or acoustic shadow. The diagnosis may be difficult in obese individuals (1). Polypoid lesions detected on ultrasound examination are not always confirmed on histopathological examination of the excised gall-bladder (5). According to numerous reports (and certain differences between them), the prevalence rate of polypoid gall-bladder lesions in healthy individuals is 3-7%, and on histopathological examination – 2-12% (2-5).

Polypoid gall-bladder lesions are classified using a system developed by Christensen and Ishak in 1970. This system includes benign lesions, such as adenomas, adenomyosis, and inflammatory and cholesterol polyps (2). Malignant polypoid lesions include adenocarcinoma and metastases from other sites (4). The following features may suggest the presence of cancer in a gall-bladder polyp: a single, sessile polyp > 1 cm; a polyp in a person aged > 50 years; a polyp accompanied by cholecystolithiasis, increasing in size on subsequent ultrasound examinations. The reported prevalence rate of malignant polyps ranges from 0 to 27% (1, 5). Despite a continuously increasing variety of imaging tests, such as USG, computed tomography, magnetic resonance, endoscopic retrograde cholangiography, and endoscopic ultrasonography, preoperative differentiation between benign and malignant gall-bladder lesions remains a very difficult task (5).

The objective of this study was to assess the accuracy of ultrasound examination in diagnostics of polypoid gall-bladder lesions by means of histopathological verification in patients treated with cholecystectomy.

**MATERIAL AND METHODS**

Data of all patients who received surgical treatment due to diseases of the gall-bladder at the Department of General and Transplant Surgery, Medical University in Łódź in the years 2011-2013 have been analysed retrospectively. The analysis included data of 1196 patients (802 women and 394 men) aged 18-90 years. Histopathological examination revealed cholecystolithiasis or chronic calculous cholecystitis in 1071 patients (772 women and 299 men). Neoplastic tumours were found in 21 patients (14 women and 7 men). Gall-bladder empyema was diagnosed in 75 individuals (42 women and 33 men), and gall-bladder polyps – in 29 patients (tab. 1).

**RESULTS**

On preoperative ultrasound examination, polypoid lesions were found in 64 patients, i.e. 5.4% of patients admitted to the Department for cholecystectomy. Of that number, in 29 patients (15 women and 14 men) the diagnosis of a polyp was confirmed on histopathological examination. These patients constituted 2.4% of all individuals qualified for gall-bladder excision. The age of patients who underwent surgery due to polypoid lesions ranged from 23 to 79 years, mean 52.9 years (50.7 in men and 54.6 in women). In 21 cases cholesterol polyps were found, in 4 cases adenomyosis was diagnosed, 3 polyps were heterotopic, and in 1 polyp cancer cells were detected. In 9 patients single polyps 0.2-4.1 cm in size were found. In 20 patients multiple polyps 0.3-3 cm in size were present (tab. 2).

In 35 cases a positive result of ultrasound examination, suggesting the presence of a gall-bladder polyp, was not confirmed by histopathological examination. Of that number, in 25 examined specimens cholecystolithiasis was found, in 6 patients microlithiasis was revealed, and in 4 cases an infiltrative neoplastic tumour of the gall-bladder was present. The polyps that

<table>
<thead>
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<th>Gall-bladder lesion</th>
<th>Number of patients</th>
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<tr>
<td>Cholecystolithiasis or chronic</td>
<td>1071</td>
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<tr>
<td>cholecystitis</td>
<td></td>
</tr>
<tr>
<td>Gall-bladder empyema</td>
<td>75</td>
</tr>
<tr>
<td>Gall-bladder tumour</td>
<td>21</td>
</tr>
<tr>
<td>Gall-bladder polyps</td>
<td>29</td>
</tr>
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</table>
proved to be malignant on histopathological examination, on preoperative ultrasound examination were 1.5 to 4.1 cm in diameter.

Malignant lesions (gall-bladder cancer) were found in five patients preoperatively diagnosed with a polypoid lesion, i.e. 7.8% of patients preoperatively diagnosed with a polyp and 0.4% of all patients who received surgical treatment. Patients qualified for surgery due to polyps diagnosed by means of ultrasound examination constituted 5.4% of all patients who underwent cholecystectomy. On histopathological examination, the presence of polyps was confirmed in 2.4% patients treated with excision of the gall-bladder.

DISCUSSION

Polyps are defined as protuberant lesions of mucous membrane of a specific organ. Polyps attached to the surface of the mucous membrane by a thin stalk are termed pedunculated. Wide-based polyps are termed sessile. Polyps may be single or multiple and of various size (6). In adult population, polyps are detected in 1.5-5.5% of individuals. In a screening study that enrolled over 190,000 individuals, polyps were detected in 6.9% of men and 4.5% of women (7, 8).

On histopathological examination, the prevalence rate of polyps is ca. 1.5%. Neoplasms are reported in 6-15% of all patients receiving surgical treatment due to cholecystolithiasis (9, 10). In our study, cholecystectomy was performed in 1196 patients. On histopathological examination, polyps were found only in 29 cases.

Gall-bladder polyps may be observed regardless of age. Most commonly, they are diagnosed in patients aged 40-70 years. Men are affected more often than women (9). However, in our study such pathological findings were present more often in women – 51.7%.

Gall-bladder polyps are usually diagnosed on ultrasound examination. According to some authors, its accuracy exceeds 70%, although false positive results are also possible (11). Of 65 patients in whom polyps were diagnosed preoperatively on ultrasound examination, only in 29 cases (44.6%) the diagnosis was confirmed histopathologically. Laparoscopic ultrasonography, a method introduced in recent years, may increase the diagnostic accuracy for detection of gall-bladder polyps even to 86.5% (12).

However, using any of the existing methods, it is still not possible to answer beyond doubt the question of whether a specific lesion is malignant or not (9). In selected papers, most of the investigated polyps (74-84.6%) were Benin (13, 14). The most common lesions were cholesterol polyps and adenomyotic polyps (9, 10, 13).

The results of our study were similar. Numerous studies concerning gall-bladder polyps confirm the thesis that such lesions may undergo malignant transformation. This was confirmed in 15.4-26% of excised gall-bladders (13, 14). In development of polypoid lesions, the most important factors are the patient’s age and the polyp size. Time and conditions required for a lesion to develop are not completely understood. Malignant lesions are more common in patients over 60 years of age, in whom the polyp size exceeds 10 mm (14, 15). The risk of cancer development does not depend on the presence but the nature of a polyp. If the polyp diameter exceeds 20 mm, it will undergo malignant transformation in nearly 100% of cases (9, 11). In contrast, malignant transformation of a polyp less than 5 mm in diameter has not been reported in the literature (9).

Cancer should be suspected in polyps larger than 15 mm in diameter and in patients over 50 years of age (9, 15). Single polyps exceeding 10 mm proved to be malignant in 88% of all cases (14). The risk of cancer is significantly higher in sessile than in pedunculated polyps. An additional alarming sign on ultrasound examination is thickening of the gall-bladder wall at the base of the polyp (9). If the course of the disease is asymptomatic and the diameter of an accidentally diagnosed polyp is below 10 mm, the risk of malignant transformation is relatively low (16). Studies demonstrated that the risk of cancer was higher in

<table>
<thead>
<tr>
<th>Polyp type</th>
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<tr>
<td>Cholesterol polyps</td>
<td>21</td>
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<tr>
<td>Adenomyotic polyps</td>
<td>4</td>
</tr>
<tr>
<td>Inflammatory polyps</td>
<td>3</td>
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<td>Malignant lesions</td>
<td>1</td>
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<td>Single polyps</td>
<td>21</td>
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<td>Multiple polyps</td>
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multiple than in single lesions. The risk of cancer development may be even twice higher in multiple lesions (10). A significant factor associated with malignancy is the polyp’s growth rate. In rapidly growing polyps, the rate is 3-5 mm in 3-6 months. Such polyps are highly dangerous and therefore such patients should be quickly qualified for cholecystectomy (6, 9). In a half of the patients with gall-bladder polyps, histopathological examination confirmed also the presence of small calculi. In our study, polyps accompanied by sediment were seen in 24.14% of cases.

Occurrence of gall-bladder cancer in patients with cholecystolithiasis may suggest an association between this condition and the presence of polyps, and, in consequence, increased risk of cancer (8).

Bearing this in mind, one must plan further management of patients in whom polyps have been diagnosed on ultrasound examination. This applies particularly to asymptomatic patients, in whom the lesions have been diagnosed accidentally. Both the doctor and the patient are aware of the risk of cancer development. Surgical treatment of such patients is justified if risk factors, such as the polyp diameter over 10 mm or the patient’s age over 50 years, are present (11, 14, 17). In the authors’ opinion, in other cases the decision between surgical treatment or procrastination should be made jointly by the surgeon and the patient, with whom all arguments for and against surgery should be discussed.

If procrastination has been selected, patients with small gall-bladder polyps, especially pedunculated, not exceeding 10 mm in diameter or completely asymptomatic, should be strictly monitored. An ultrasound examination every 6 months is recommended (10). There is little doubt that patients with large, sessile, or rapidly growing polyps should be qualified for cholecystectomy as soon as possible due to a very high risk of cancer (14).

Patients with gall-bladder polyps accompanied by intermittent pain in the right subcostal area due to food intolerance constitute another problem. They usually agree to surgical treatment, which should be preceded by diagnostic procedures to exclude diseases producing similar symptoms (1). Resolution of the symptoms after cholecystectomy in more than 93% of cases confirms a close relationship between the symptoms and the presence of pathological lesions in the gall-bladder (18-19). Coexistence of small calculi and polyps in excised gall-bladders, undiagnosed on preoperative ultrasound examination, is an additional argument for surgical treatment (1).

If surgical treatment has been decided upon, patients diagnosed with gall-bladder polyps should be qualified for laparoscopic cholecystectomy. It is the gold standard in cholecystectomy as this kind of treatment results in quick healing and return to normal daily activities. Only in a few patients with significant contraindications to laparoscopic surgery (e.g. a history of multiple surgical procedures in the epigastrium) classic cholecystectomy should be performed. A suspected cancer lesion in the gall-bladder should not be regarded as an a priori indication to open surgery (20).

CONCLUSIONS

1. Among 1196 patients qualified for cholecystectomy, gall-bladder polyps were detected on preoperative ultrasound examination in 64 patients. Only in 29 cases (44.6%) the diagnosis was confirmed histopathologically.

2. Of 64 patients diagnosed with gall-bladder polyp on ultrasound examination, in 5 gall-bladder cancer was found (i.e. in 7.8% of patients with this diagnosis). In most histopathologically confirmed cases, adenomyosis or cholesterol polyps were found.

3. In the authors’ opinion, detection of a gall-bladder polyp on ultrasound examination is an indication for cholecystectomy, in particular when the polyp diameter exceeds 10 mm. In each case of a polyp, cholecystolithiasis should also be taken into account and the presence (or absence) of indications for cholecystectomy should be discussed with the patient.
REFERENCES