The most frequent benign gallbladder polyps are cholesterol polyps. Next in frequency were adenomas, which may have malignant potential. The aim of this study was to assess the possibility of ultrasonography in the diagnosis and differential diagnosis of cholesterol polyps compared to adenomas. Patients were examined during the period from October 2006 to December 2008. In Department of Ultrasound, Clinic for Gastroenterology and Hepatology, Belgrade. The group of 54 patients analyzed consisted of 30 women (56%) and 24 men (44%). Most (59%) had solitary polyps. In 92.6% of patients the size of polyps was below 10 mm. 74% of respondents were over 50 years. Ultrasonography is the method of choice and gold standard in diagnosis of gallbladder polyps. Based on echoic properties cholesterol polyps cannot be distinguished from adenomas. Malignant alteration of polyps also could not be detected. Appropriate ultrasonographic characteristics such as size of polyps, appearance of a broad base that sits on the wall, concomitant lithiasis findings and patient age may be indicative for malignancy.

Key words: ultrasonography, cholesterol polyp, adenoma, malignant alteration

INTRODUCTION

Gall bladder polyps are tumors or growths like tumors that originate from the mucosa of the gallbladder wall. The term polypoid lesion of the gallbladder is related to any elevated lesion of the mucosal surface of the walls. The nature of polypoid lesions of the gallbladder is not easy to define. Polyps of the gallbladder are relatively common finding, according to different authors can be found in 2%-5% of the population and are more common in women. They are generally benign, although they may carry the risk of malignant alteration.

The most numerous benign polyps are cholesterol polyps. They may be solitary but are often multiple. They are usually attached to the wall by stem. They are smaller than 10 mm in size. According to some studies, an average size is about 6 mm. Virtually, their alteration is not malignant. Cholesterol polyps are a form of gallbladder wall cholesterolosis and the result of the cholesterol esters deposition in the submucosal macrophages of the lamina propria of the gallbladder mucosa.

Ultrasonographically, they are presented as static, fixed, hyperechogenic and prominent structure which can rarely cast a mild acoustic shadow. In that case, it differs from the concrements by its immobility. Usually, they do not lean against the gallbladder wall by their broad base.

The most numerous polyps after the cholesterol ones, although far less common, are adenomas. In general population, they may be seen in 0.4%. They are attached by their broad base to the gallbladder wall, but they also may be peduncular. Their size is about 10 mm although they may be bigger. In a larger study of the gallbladder polyps, the percentage of cholesterol polyps was around 95% while the adenoma was detected in 4% of the time. The remaining 1% consisted of other types of the gallbladder polyps.

Sonographically, adenoma or adenomatous polyp looks like solitary, hyperechogenic, static structure, which originates from the gall bladder wall protruding into the lumen and not casting the acoustic shadow. On ultrasonography, they are hardly distinguished from cholesterol polyps that are much more common (Figure 1).

Adenomas can become malignant in some percentage. Most authors agree that there are clinical signs suggestive of possible malignant alteration of adenomas. The most important clinical and ultrasonographic parameters are as follows:
- The size of polyps larger than 10 mm
- Patient’s age over 50 or 55 years
• sessile polyps overlying the lining by their broad base
• thickening of the gallbladder wall in the vicinity of polyps and retractable wall
• vague contours of polyps and their uneven surface
• rapid growth of polyps
• concomitant lithiasis with cholecystitis

Symptomatology: Polyps of the gallbladder do not hurt. The majority was discovered during the abdominal ultrasound examination, which was performed for other diagnoses. However, if pain was present, differential diagnosis of the lesion would correspond more to concrement, which could have a similar ultrasonographic appearance as polyp. Much rarely, malignantly altered polyp will be considered.

Diagnosis: Gallbladder polyp is relatively easily diagnosed using the ultrasound. The accuracy of ultrasonic technique examination, when diagnosis of polyps is in question, is high, even up to 90%. If there were diagnostic dilemmas, other morphological techniques might be applied for higher accuracy, but they are more expensive: CT, MRI and PET.

A small polyp could be often overlooked if the gallbladder wall was thickened. In this case, inadequate sections of gall bladder during the examination may guide an ultrasonographer to a wrong direction and mimic the nonspecific thickening of the walls, which may be seen in cholecystitis, viral hepatitis, AIDS, etc. The presence of calculi may mask the polyps, so it is always advised to examine the patient in different positions. Although the majority of gallbladder polyps is benign, early cancers of the gallbladder may have a similar appearance. The prognosis of the advanced malignant polyp is poor. Healing is much more likely in the early stages. If there was a suspicion of malignancy, a conventional open surgery would be indicated instead of the laparoscopic operation. When the diameter of polyp is shorter than 10 mm, this polyp is monitored by ultrasound examination in a 6-month period. If the polyp was silent, its shape or size remained unchanged, and the patient had no symptoms, the polyp would be controlled annually.

OBJECTIVES

The objectives of this study were as follows:
1) to analyze the possibilities of ultrasonography in diagnosis of the gallbladder polyps; 2) to establish the value of ultrasonography in determining the location, position, size and appearance of the gallbladder polyps; 3) to evaluate the role of ultrasonography in differential diagnosis of the gallbladder polyps in relation to adenoma and carcinoma, and 4) to recommend appropriate algorithms of the ultrasonographic analysis of the gallbladder polyps.

METHODOLOGY

The subjects were healthy individuals without symptoms and signs, who underwent routine ultrasound examination of the abdomen and who had no pathology relevant to our research. Out of 54 patients, 30 were women and 24 were men. The age of the subjects ranged from 30 to 80 years. In all patients, one or more polyps of the gallbladder were detected by ultrasonography.

Patients who entered this trial were examined in Ultrasound Diagnostics Department, Clinic of Gastroenterology and Hepatology, Belgrade, in the period from October 2006 to December 2008, by means of the apparatus Hitachi EUB 6500 and Toshiba CoreVision SSD. 3.5 to 5 MHz multifrequency convex probe was used. In all patients, the ultrasound showed the presence of one or more polyps in the gallbladder. The patients were evaluated after eight-hour break from the food ingestion. The patients were placed in classical position, i.e. in supination, and standard subcostal and intercostal sections were involved.

FIGURE 1
POLYP MEASURING ABOUT 12 mm WHICH SITS A SMALL BASE ON THE WALL OF THE GALLBLADDER

FIGURE 2
GALLBLADDER POLYP MEASURING ABOUT 15mm WHICH OVERLAPS A BROAD BASE OF THE WALL
The number, size and location of polyp were analyzed. A number of sections was applied to visualize the basis of polyp and the neighboring gallbladder wall where the polyp originated from. The contours of polyp, echogenic properties, motility and concomitant presence of concrements were observed (Figure 2).

A descriptive statistical data processing was carried out on the entire sample and individually for males and females.

**RESULTS**

The group of 54 subjects consisted of 30 females (56%) and 24 males (44%). This sample was used for analysis of the parameters shown below.

The subjects (54) were analyzed by the number of gallbladder polyps. The results were presented in tables.

Most of our patients had solitary polyps, i.e. 59% of our subjects. Multiple polyps were detected in the remaining 41% of them.

The distribution of the entire sample of 54 subjects by the size of gallbladder polyps was shown in Table 2.

The presented results showed that smaller-sized polyps were most frequent belonging to the group of 0.5 to 5 mm - there were 20 of them or 37% of the sample, followed by the group of 6 to 10 mm - 30 or 55.6%. A total percentage of smaller polyps was 92.6%. The largest in size polyps were the least in number, that is, in the group over 10 mm there were 4 polyps or 7.4% of the observed sample.

The distribution of the entire sample of 54 subjects by age and sex was shown in Table 3. The results clearly showed that polyps were more common in the advanced age, i.e. 74% of subjects were over 50 years.

The position and location of polyps in relation to anatomical parts of the gallbladder were examined ultrasonographically. The most common location of polyps was the body of the gallbladder, which was illustrated in Table 4.

**DISCUSSION**

Generally, cholesterol polyps are more often seen as multiple, but our patients manifested a higher percentage of solitary ones (59%). Bearing in mind that only adenomas, which are solitary, may become malignant, it is very important to distinguish solitary from multiple polyps in differential diagnosis (Figure 3). Multiplicity of the polyps removes doubts that the adenoma is in question and consequently the possibility of malignant alteration. Tubular adenomas with high grade dysplasia were also described.

Polyp size is an important factor in the general analysis. Many authors suggest 10 mm as a threshold size because it is considered that smaller polyps have no malignant alteration. The prevalence of polyps larger than 10 mm in our patients was low (7.4% on a sample of 54 patients). Some authors correlated the polyp size evaluated by ultrasound with the actual size measured on the specimen after cholecystectomy. A highly significant correlation was found.

Many authors believe that there are more statistically significant data on risk factors of gallbladder polyp malignancy in so far it is bigger than 10 mm: local invasion, vascularity, size, and simultaneous presence of calculi.
Smaller polyps ranging from 6-10 mm prevailed in our study (55.6% in a sample of 54 patients). In addition, ultrasound character of these polyps was not suggestive of possible malignancy. Some authors have different opinion. They consider that smaller adenomatous polyps carry the risk of malignancy, and their careful long-term monitoring helps in detection and early treatment of the gallbladder carcinoma.

Nevertheless, the size of polyps is considered the predictor of their malignant alteration, and naturally, along with other parameters such as age and concomitant diseases.

The polyps in patients included in our study had not the characteristics that were indicative of possible malignant potential of the lesion. Similar to our results, some studies found that, in polyps smaller than 10 mm, there was no risk of the invasive cancer in any of their patients. In general, the size of polyps and the thickness of the surrounding gallbladder wall may be important for assessment of the malignant potential. Looking separately, echogenic property of the polyp per se is not sufficient for assessment of the malignancy.

Regarding the age in our sample, there were no patients younger than 30 years. A similar pathology, although rare, can be found in the pediatric age group. Seven-year follow-up of polyps in pediatric age was described and no changes in the size, location and shape were found. Age structure, over 50 or 55 years of age, with the size of polyp is an important predictor of the potential malignant alteration. In our study, 74% of patients belonged to the age group over 50 years.

Our study and data from the literature did not point out any particular significance of the localization of gallbladder polyps. In our study, polyps were most common in the body of the gallbladder (30 in a sample of 54 patients). However, localization in the infundibulum may be an indication for cholecystectomy.

An impaired lipid metabolism was mentioned in the literature as possible etiologic factor of the cholesterol polyps.

Considering the treatment, not all polyps are operated because the majority is benign. Cholecystectomy is performed when the diameter of polyp is longer than 10 mm, due to increased risk of malignancy. According to some authors, cholecystectomy is also indicated when polyp diameter is less than 10 mm and a patient is over 50 years of age. In addition, when polyp is larger than 10 mm and associated with the pain and concrements, gallbladder cholecystectomy is also a mode of treatment.

CONCLUSION

1. Our work, as well as numerous references, has shown that the ultrasonography is a method of choice and golden standard for diagnosis of polypoid lesions of the gallbladder.

2. Ultrasonography provides a detailed visualization of the location, position, size and echogenic properties of the polyp.

| TABLE 3 |
| DISTRIBUTION OF POLYPS ACCORDING TO AGE AND SEX |

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<th>Females</th>
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<td>15</td>
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<td>2</td>
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<td>11</td>
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| TABLE 4 |
| DISTRIBUTION OF POLYPS ACCORDING TO LOCALIZATION |

<table>
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</table>

3. On ultrasonographic examination, neither can cholesterol polyp be differentiated clearly from adenoma nor can malignant alteration in the polyp itself be recognized only on the basis of the echogenic appearance. Nevertheless, the appropriate ultrasonographic characteristics such as the size of polyps, position against the wall and concomitant finding of lithiasis point to potentially malignant lesion.

4. Based on the results of this study, we recommend the following algorithms for ultrasound examination of the gallbladder. Before all, as many as possible adequate ultrasonographic sections are needed, which will enable positive identification of small polypoid lesions as well as their precise number. The sonographic study of the polyp structure, size and anatomical relation to the gallbladder wall is also advised. Moreover, it is necessary to detect with certainty the concomitant presence of the calculi. Examinations should be repeated in a given period of time in order to monitor the potential growth of polyps. The ultrasonographic examination is very important for differential diagnosis of gallbladder adenoma and carcinoma.

SUMMARY

Najbrojniji benigni polipi žućne kesice su holesterolski polipi. Sledeci po učestalosti su adenomi, koji mogu imati maligni potencijal. Cilj rada bila je procena mogućnosti ultrasonografije u dijagnozi i diferencijalnoj dijagnozi.
holesterolskih polipa u odnosu na adenom. Pacijenti su pregledani u periodu od oktobra 2006. do decembra 2008. u Jedinci za ultrazvučnu dijagnostiku, Klinike za gastroenterologiju i hepatologiju u Beogradu. Grupu od 54 analiziranih ispitnika sačinjavalo je 30 'ena (56%) i 24 muškaraca (44%). Većina (59%) je imala solitarne polipe. U 92,6% bolesnika veličina polipa bila je do 10 mm. 74% ispitnika imali su preko 50 godina. Ultrasonografija je metoda izbora, odnosno zlatni standard u dijagnostici polipa užne kesice. Na osnovu ehogenih svojstava ne može se razlikovati holesterolski polip od adenoma ni prepoznati maligna alteracija. Odgovarajuće ultrasonografske karakteristike kao što su veličina polipa, odnos prema zidu, konkomitantni nalaz litijaze, kao i uzrast bolesnika mogu upućivati na malignu alteraciju.

Ključne reči: ultrasonografija, holesterolski polip, adenom, maligna alteracija

BIBLIOGRAPHY


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