

A correlation between sonographic and histopathological findings of gallbladder polyps

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Abstract

Gallbladder polyps have become a common ultrasonographic finding. The management of these polyps is complex since they can carry malignant lesions. Our study had aimed to analyze the results of ultrasound and pathological findings of patients operated upon due to polyps in the gallbladder. The study includes patients with ultrasound diagnosis of gallbladder polyps who underwent cholecystectomy in 2017-2019 were reviewed, and demographic, sonographic and histopathological data were collected. Sixty-eight patients were involved in the study. The median age was 42 ± 7 years, and 63.2% of our patients were women. The average size of the ultrasound polyps was 6.8 ± 4 mm. Histopathology confirmed the presence of polyps in 95.6% of patients, with an average size and number of lesions of 7.5 ± 5.8 mm and 1.7 ± 1.2 , respectively. Eight polyps were larger than 10 mm, and the individual polyps were significantly larger than the multiple ones ($p = 0.004$). Three cases of adenoma were diagnosed (4.6%); one of them was cancer in situ. All were single and over 10 mm. We found an important correlation between determining the size of an ultrasound polyp and the pathological anatomy ($r = 0.93$; $p = 0.002$). The tumor size was an indication of the presence of adenoma ($p = 0.009$, 95% CI = 1,113-1,678). We have concluded that there is a clear correlation between the size of the gallbladder tumor on ultrasound and the size in the pathological report. Gallbladder adenoma is uncommon and it correlates with the size of the polyp. In this study, the size was the only indicator of the presence of adenoma.

Key words: Gallbladder polyp; Gall bladder adenoma; Gallbladder pathology

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Introduction

Gall bladder polyp is an increasingly common diagnosis, mainly finding abdominal ultrasonography requested for another reason (incidental finding) ^(1, 4). It defined as an elevation of the mucosa of the gallbladder. They are classified as malignant (adenocarcinoma, metastasis, and others) and benign lesions, either being tumor (adenoma, leiomyoma, lipoma) or pseudotumoral (cholesterol polyps, adenomyomas, inflammatory polyps, hyperplastic polyps, others) ⁽⁵⁾. Epidemiological studies report an ultrasound prevalence of polypoid lesions between 4.0% and 5.6% ^(2, 6). On the other hand, its incidence in cholecystectomies reaches up to 13.8% in different international series ^(7, 8). The importance of an accurate diagnosis is related to the possibility of developing a malignancy from an adenoma ^(11, 13). In addition, it is known that GB adenocarcinomas could also adopt polypoid forms in ultrasonography. An abdominal ultrasound has been used commonly for gallbladder pathology diagnosis, likely secondary to its accessibility, ease, and affectability. Ultrasonography is important to detect GB polyp before the operation to assess polyp size and location to be correlated with histologic findings. The discrimination among gallstones and polyps utilizing ultrasound might be troublesome particularly when polyps are small in size (<5 mm) ⁽¹⁴⁾. The objectives of this study are to correlate ultrasound and histopathological findings in patients with gallbladder polyp operated on and identify the predictors of GB adenoma.

Patients and Method

This is a prospective study was done in Nasiriyah city, Thi-Qar province during the period 2017-2019 years. In which we examine patients with gallbladder polyp who planned to undergo a cholecystectomy using an ultrasound machine General Electric’s Logiq E9 machine with a C1-5 probe. The demographic data of each patient and the abdominal ultrasonography reports were recorded. A polyp was considered to be any lesion raised to the GB lumen with echogenicity similar to its wall, with or without pedicle, non-moveable and without acoustic shadow. Histopathological reports were reviewed and correlated with ultrasound information. We excluded patients with sonographic signs of acute or chronic cholecystitis from the study, as this affects GB wall thickness.

The data was entered and analyzed in a database in the Windows SPSS v 23.0 software. The continuous variables are expressed as average and standard deviation and were analyzed by variance analysis (ANOVA) and Student's t-test. For contingency tables, the Chi-square test or Fisher's exact test was used. The relationship between continuous variables was evaluated by the Pearson correlation coefficient. For the identification of predictors of adenoma in GB polyps, logistic regression analysis was used. A p-value <0.05 was considered statistically significant.

Results

During the studied period, 68 patients underwent cholecystectomy for GB polyp, 43 of them (63.2%) were female, while 25 of them (36.8%) were male. All patients were operated laparoscopically. The average age was 42 ± 15 years. According to the abdominal ultrasonography, the number of polyps was 1.2 ± 0.9 per patient, and the average size was 6.8 ± 4 mm. The histopathological study showed the presence of polyps in 65 of the 68 patients (95.6%), while in the remaining 3 (4.4%) no polyps were detected in the operative specimen (the cause could only focal wall thickening or partial septum). The size and number of polyps per patient were on average 7.5 ± 5.8 mm and 1.7 ± 1.2 polyps respectively. Of the 65 patients with polyps, adenomas were diagnosed in three cases (4.6%), one of which showed foci of carcinoma in situ. The rest corresponded to pseudotumors composed of cholesterol polyps, inflammatory polyp, adenomyosis, and cholesteroliasis (Table 1). In all patients with GB adenoma, the ultrasonographic and histopathological lesion was unique and greater than 10 mm. No case with invasive carcinoma demonstrated. Multiple polyps were found in 14 (21.5%) of the cases. Seven cases (10.8%) of the polyps were greater than 10 mm. No significant differences were shown for age according to type ($p = 0.6$), size ($p = 0.56$) and number of polyps ($p = 0.76$) (Table 2). No statistically significant difference in sex was shown according to the type of polyp ($p = 0.66$). The average size of the single polyp was significantly greater than that of the multiple polyps ($p = 0.004$) (Table 3), without finding a significant association between the type of polyp and the number ($p = 0.122$). The correlation coefficient (r) between the size of the polyp by ultrasonography and the size in the histopathological study is 0.93 ($p = 0.002$), considered significant (figure 1). Cholelithiasis was diagnosed in 17 (26.2%) of the cases; no association was found between their presence and the type of tumor ($p = 0.15$). According to the logistic regression analysis, the size of the polyps was identified as the only predictor of adenoma in the histopathological study, with an OR of 2.156 (95% CI = 1,113-1,678), $p = 0.009$.

Table (1): Description of vesicular polyps in the histopathology

Type of polyp	Number	Percentage
Pseudotumor		
Cholesterol polyp	41	63.1%
Inflammatory polyp	11	16.9%
Adenomyosis	6	9.2%
Cholesterolosis	4	6.2%
Tumor		
Adenoma	3	4.6%
Total	65	100%

Table (2): Analysis of age according to number, size, and type of polyps in histopathology

Parameter	Category	Number of polyps	Percentage	Age in years (average ± SD)	P-value
Number of polyp	1	51	78.5%	43±12	0.76
	≥2	14	21.5%	44±13	
Size (mm)	≤5	39	60%	45±17	0.56
	6-10	19	29.2%	42±15	
	≥10	7	10.8%	49±14	
Type	Pseudotumor	62	95.4%	42±15	0.6
	Tumor	3	4.6%	50±12	

Table (3): Correlation between the size and the number of GB polyps in histopathology

Number of polyps	Size	P-value
1	6.9±0.9	0.122
≥2	3.8±0.7	

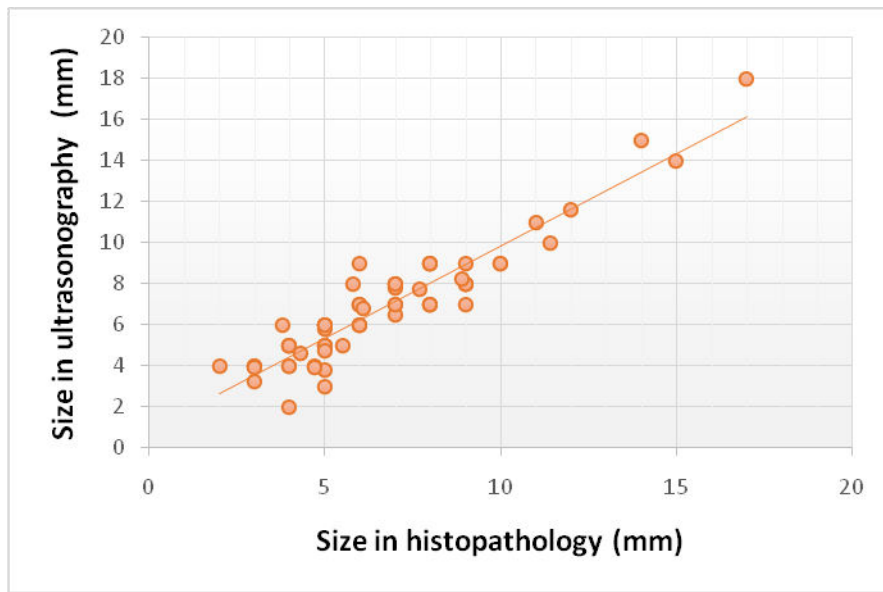


Figure (1): Correlation between the size of GB polyps in histopathology and in ultrasonography

Discussion

The finding of a GB polyp implies a controversial decision making, due to the possibility of being a form of presentation of adenocarcinoma or of developing a malignancy from it. Ultrasound diagnosis poses an important challenge in this regard because it is frequently detected in patients who undergo this examination for other reasons^(1,4). It has been described that the sensitivity of ultrasonography for the detection of GB polyps ranges between 32%

and 90%^(3, 8), with a specificity of 93.9%⁽⁸⁾. While this method would have advantages over others to detect small lesions, consider the performance of ultrasonography also depends on the size of the lesions, the presence of gallstones, operator experience and the quality of the ultrasound machine⁽¹⁴⁾. In this series, all lesions larger than 10 mm were reported on ultrasound as polyps of at least that size. In addition, it could be established that the abdominal ultrasonography would provide safe information regarding the lesion size and that the size would also guide the tumoral nature of the polyp. Boulton et al⁴ mentioned ultrasonographic characteristics that would allow differentiating cholesterol polyps from other benign lesions, which are characteristically small, multiple and hyperechoic to ultrasonography due to their lipid content. To confirm this, prospective studies are needed. In this series, all adenomatous lesions were greater than 10 mm, which is confirmed by logistic regression analysis, which shows the size as the only predictor of adenoma. It has been described that the size and number of polyps are related to the histopathological characteristics of GB polyps and that size would be the most important predictor of malignancy in GB polyps,⁽¹⁵⁾ with up to 88% of neoplastic lesions larger than 10. mm⁽¹⁶⁾. On the other hand, studies suggest that small and numerous polypoid lesions in ultrasonography correlate with benign polyps^(8, 16), which do not tend to enlarge in time^(17, 18). The treatment of the GB polyp diagnosed by images can take two courses: the surgical one, or the ultrasound follow-up. In this regard, Moriguchi et al,⁽¹²⁾ in a follow-up study of 109 patients with vesicular polyps, mostly multiple and smaller than 5 mm, reported that 88.3% of them did not change in size or were reduced in an ultrasound follow-up. 5 years. Another recent study, with an ultrasound follow-up of 12 years, showed that 50% of GB polyps remain the same size and that 23.5% decreased in size or disappeared⁽¹⁷⁾. However, this behavior requires answering questions about what are the risk factors of malignant changes of the diagnosed polyp, among which is described the age, size greater than 10 mm, sessile, rapid ultrasound growth, and associated cholelithiasis, which is a recognized risk factor for GB carcinoma^(6,8,12,15). The series under study shows a higher average age for patients with adenomatous lesions (50 years vs 43 years), a difference that is not significant, probably due to the small number of adenomatous polyps found. Age greater than 50 years is considered as an independent factor to predict a tumor polyp⁽¹⁶⁾, and would constitute a risk factor for malignancy^(3, 6, 8). Regarding gender, there would be no clear relationship with the prevalence of polyps^(1, 2, 8) or the risk of malignancy, although some series support the latter^(10, 16). Our study showed a higher frequency of these lesions in women, as well as other series^(10, 19), but its relation to the type of polyp was not shown. The most frequently found histological type was the cholesterol polyp, as in other international series^(10, 13, 16, 18). GB adenoma, on the other hand, is a rare diagnosis, with prevalences described in cholecystectomies of 0.09% -1.1%^(10, 14, 16). It has been described as having a malignant potential⁽¹³⁾, which apparently would be associated with its size⁽¹²⁾. Kozuka, in a series of 18 vesicular adenomas, reported the presence of cancer in seven of them, whose average size was greater than benign adenomas, and remains adenoma in 19% of invasive carcinoma¹⁴, which, according to the author, would support the theory of the adenoma-cancer sequence. In this series, the only malignant lesion was found in an adenoma. However, due to the small number of cases, and not comparing it with the total of GB cancers, it is not possible to confirm this hypothesis.

In summary, the size would be the most important variable to consider in the management of GB polyps, since it is related both to the diagnosis of adenoma and to the risk of malignancy. Since it can be estimated through the abdominal ultrasonography, we consider this test a good element of evaluation.

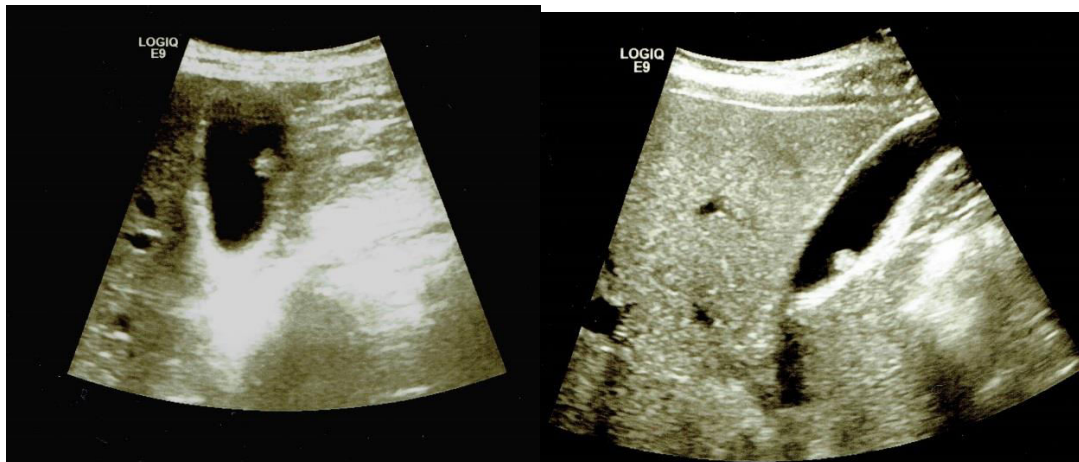


Figure (2): ultrasound images of GB polyp

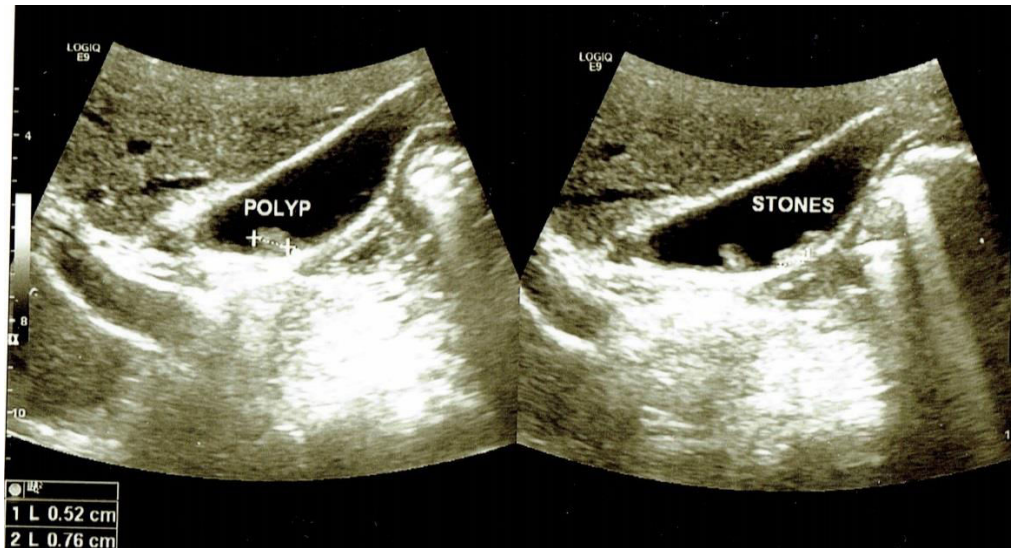


Figure (3): ultrasound images of GB polyp and stones

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