

Endoscopically Obtained Bile Aspirate is an Accurate Adjunct in the Diagnosis of Symptomatic Gallbladder Disease

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ABSTRACT

Objectives: The experience of a single surgeon in a rural hospital over a 10-year period was analyzed with respect to the utilization of endoscopically obtained bile aspirates as an adjunct in the diagnosis of symptomatic gallbladder disease.

Methods: A retrospective study of the author's entire cholecystectomy experience over a 10-year period with 641 patients was conducted to evaluate the utility of the bile aspirate in the preoperative selection of operative candidates and with respect to the ultimate pathologic diagnostic accuracy of the test.

Results: Derivation of preoperative diagnosis via traditional standard means was possible in 479 patients. An endoscopically obtained positive bile aspirate was found in 162 additional patients who failed to have positive traditional diagnostic studies (acalculous gallbladder disease). Micro-pathology was determined to be present in 603 patients (94.07%). In 27 of the 38 negatives, there had been positive radiological studies (71%). In 11 of the 38, a positive preoperative bile aspirate had been obtained (28.9%). Of the 162 patients with a positive bile aspirate, 151 (93.21%) of the gallbladder specimens had confirmatory histologic analysis (92.1% confidence interval \pm 3.95%).

Conclusion: In patients with symptoms suggestive of clinical gallbladder disease and negative traditional diagnostic studies, the endoscopically obtained bile aspirate has been shown to be a highly reliable tool in establishing the diagnosis and is recommended as an aid in the appropriate selection of candidates who may benefit from cholecystectomy.

Key Words: Acalculous, Endoscopic, Duodenal bile aspirate, Gallbladder disease.

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INTRODUCTION

Patients offering symptom complexes and history and physical findings consistent with biliary colic or cholecystitis that have nondiagnostic traditional radiologic studies may represent cases of biliary dyskinesia or acalculous cholecystitis.^{1,2} Acalculous cholecystitis has been a somewhat controversial entity that accounts for 5% to 22% of cholecystectomies in some series.^{1,3,4}

A high percentage of patients with impaired gallbladder ejection fraction (bile stasis or biliary dyskinesia) will have microcrystals in their gallbladder bile and pathologic evidence of chronic cholecystitis. The data suggest that a spectrum of biliary diseases exists in which bile saturation and gallbladder dysmotility lead to crystal growth, sludge formation, and subsequent chronic inflammation. Biliary pain may be generated at any point in this spectrum.^{5–7}

Acalculous cholecystitis may precipitate disabling and, at times, potentially life-threatening complications, unrelated to macroscopic lithiasis. Acalculous cholecystitis may present at any age, including the pediatric group, which may be much more common than commonly believed and therefore underdiagnosed and insufficiently treated.^{7–22}

Other abnormalities may be present that can be the cause of upper abdominal pain, bloating, nausea, and emesis. Such conditions as gastritis (infectious or nonspecific), pyloric dysfunction, enterogastric reflux, and peptic ulcer disease, among others, may occur individually or in combination with one another and with biliary tract disease. Duodenal bile has been shown to be abnormal in acalculous cholecystitis.¹³ The diagnostic dilemma can be sorted out via endoscopic examination combined with endoscopically obtained duodenal bile aspirate analysis.^{23–26} The Meltzer-Lyon test, easily performed in conjunction with the commonly performed esophagogastroduodenoscopy (EGD), is an efficient method to rule out other pathology and accurately diagnose acalculous cholecystitis.²⁶

The microscopic examination of endoscopically obtained duodenal bile is nearly as reliable as microscopic examination of bile that has been aspirated directly from the

gallbladder (being qualitatively similar, but more dilute).^{23,27,28}

Bile aspirate microscopy has been utilized to assist in establishing the diagnosis of acalculous cholecystitis, and direct microscopy can be regarded as the diagnostic gold standard for biliary sludge. The presence of microcrystals and white blood cells are the essentials of a “positive” duodenal aspirate analysis.^{8,15,17,20,24,25,29–31}

Microlithiasis is very rarely found in examined bile from symptomatic postcholecystectomy patients (0.5% frequency), indicating that this is primarily a cholecystic phenomenon.^{18,32}

Many clinicians look only to radiologic means in diagnosing gallbladder disease. When these modalities are non-diagnostic but the patient’s symptoms suggest a gallbladder cause, the astute clinician should look further.^{2,4,24}

PATIENTS AND METHODS

The author’s experience as a single surgeon in a small rural hospital over a 10-year period was retrospectively analyzed with respect to the utilization of the endoscopically obtained duodenal bile aspirate as an adjunct in the diagnosis of symptomatic gallbladder disease.

Patients with abdominal symptoms suggestive of biliary dyskinesia, but with nondiagnostic traditional radiologic studies were evaluated via endoscopy to rule out other pathologic symptom sources and to obtain a bile aspirate if no other significant disease process was found.

At the time of endoscopy, a suction trap was utilized on the suction port of the endoscope. No suction was applied until the endoscope was in position within the duodenum adjacent to the ampulla of Vater. (This ensures that an accurate duodenal fluid sampling is obtained, without fluid contamination from other areas of the upper intestinal tract. If the duodenum is dry, a washing may be obtained that will provide a diluted but qualitatively accurate specimen).

A retrospective study of the author’s entire cholecystectomy experience between October 1995 and October 2005 with 641 patients was conducted. To evaluate the utility of the endoscopically obtained bile aspirate in the preoperative selection of operative candidates, the ultimate pathologic diagnostic results were correlated.

RESULTS

Derivation of preoperative diagnosis via traditional standard means was possible in 479 patients (74.7%). An

endoscopically obtained positive duodenal bile aspirate was found in an additional 162 patients (25.3%), who were symptomatic of biliary disease but who failed to have positive traditional diagnostic studies.

Micropathology was determined to be present in 603 patients (94.07%). In the remaining 38 patients who had negative histologic findings, 27 (71%) had positive preoperative radiologic studies, while 11 (28.9%) had positive preoperative bile aspirates. In this group of negatives, it was more than twice as likely for a patient to have had a positive radiologic test versus a positive bile aspirate, preoperatively.

In the 162 patients with a positive bile aspirate, 151 (93.21%) had confirmatory micropathology (92.1% confidence interval, \pm 3.95%). This compares favorably with the 94% positive rate reported in the literature.²

In comparison, of the 479 patients diagnosed via traditional means, 452 patients had positive micropathology (94.36%), accounting for 75% of the total with proven pathology.

In this series, 151 of the subsequently proven pathologic gallbladders had been missed by traditional diagnostic endeavors, accounting for 23.56% of the 641 initially symptomatic suspects for disease and 25% of the total with proven disease (**Figure 1**).

Interestingly, 2 patients had negative ultrasounds, negative Hida scans, but positive bile aspirates and positive micropathology. There was even one patient who had a negative ultrasound, a negative Hida scan, a negative CAT scan, but a positive bile aspirate and positive micropathology.

There were 20 patients below the age of 19, (range 11 to 18 years). There was confirmatory micropathology in 17 (85%) of this group. One of the 3 negatives had a positive preoperative ultrasound. One of the remaining 2 negatives had a positive bile aspirate, classic right upper quadrant, and severe postprandial abdominal symptoms that had caused him to miss 3 out of the first 7 weeks of the fall school term. At operation, he was found to have dense adhesions on the gallbladder and a very tightly spiraled cystic duct. He successfully returned to school resuming a normal diet and activity status <1 week after the operation.

DISCUSSION

The literature suggests that patients with symptoms of biliary tract disease, but no gallstones on ultrasonography,

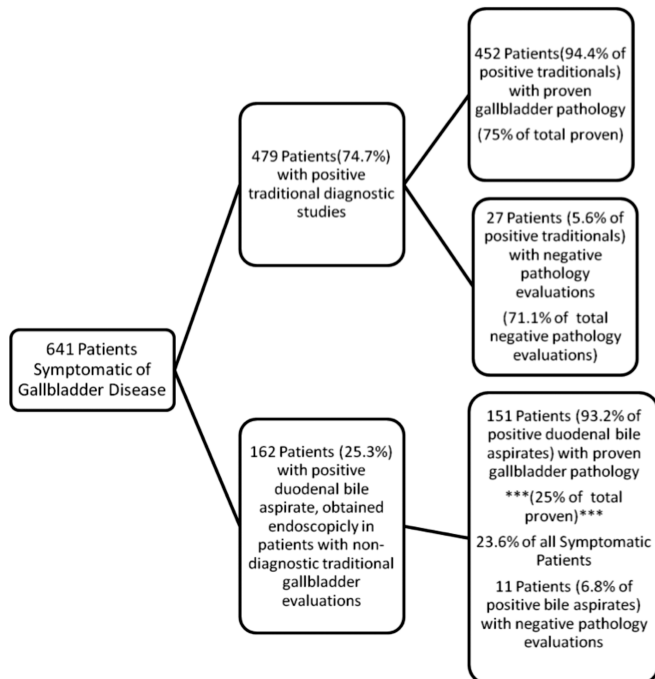


Figure 1. Diagnostic/Treatment Pathway Results for 641 Patients Diagnosed with Clinical Gallbladder Disease.

are more common than previously thought. Such patients may benefit from cholecystectomy for acalculous gallbladder disease, with a high degree of patient satisfaction achieved after such surgical therapy.^{1,2,4,24,25,30,33-37}

Early diagnosis and cost containment are advantages of the endoscopically obtained bile aspirate analysis that results in appropriate and timely surgical intervention for what may be otherwise very diagnostically challenging patients.²⁶

Our experience with endoscopically obtained bile aspirate has shown similar results and a high specificity of diagnostic-pathologic accuracy (93.21%). This represents excellent relative specificity for a diagnostic test that has the added value of accurately and simultaneously ruling out other common conditions that may share some symptoms with biliary dyskinesia or nonlithiasic cholecystic disease.

It is therefore felt that in our patients with symptoms suggestive of biliary pain or dyskinesia, but who had negative traditional studies, the duodenal bile aspirate analysis combined with the diagnostic capabilities of the EGD was demonstrated to be a successful and reliable tool in establishing the diagnosis of gallbladder disease, and was important in the selection of candidates for ap-

propriate definitive therapy via cholecystectomy. It was a valuable tool in identifying the nearly 25% of symptomatic patients with provable gallbladder pathology who would have been otherwise missed or treatment delayed due to reliance solely on traditional diagnostic methods.

CONCLUSION

The endoscopically obtained duodenal bile aspirate is a very accurate adjunct in the preoperative diagnosis of symptomatic gallbladder disease and should be a standard part of every surgeon's diagnostic acumen. Acalculous gallbladder disease remains a clinical diagnosis; however, that requires careful consideration and judgment by the surgeon involved with the care and treatment of this frequently underdiagnosed group of patients.

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