Int Surg 2017;**102:**233–237
DOI: 10.9738/INTSURG-D-15-00110.1

Should We Perform Routine Upper Gastrointestinal Endoscopy Before Cholecystectomy?

Emre Gunay, Haci Hasan Abuoglu

Department of General Surgery, Haydarpasa Numune Education and Research Hospital, Istanbul, Turkey

In some patients, there is not any symptomatic relief after cholecystectomy due to the overlap of the symptoms of biliary and gastroduodenal pathologies known as postcholecystectomy syndrome. The aim of this study was to assess the effectiveness of upper gastrointestinal (UGI) endoscopy in reducing the possibility of postcholecystectomy syndrome. This retrospective study was conducted in 194 cases. In patients sampled for histopathologic examination, screening for *Helicobacter pylori* and intestinal metaplasia was carried out with Giemsa stain and PAS–Alcian stain. Patients who did not undergo UGI endoscopy before operation were designated as Group A (n = 100) and those who underwent routine UGI endoscopy before operation were called Group B (n = 94). Symptomatic relief after cholecystectomy and endoscopic findings were evaluated. Thirty-one of the 39 patients diagnosed with *H. pylori*, underwent eradication treatment. Seven of the 31 patients undergoing *H. pylori* eradication during the preoperative period had ongoing symptoms at the postoperative period. On the other hand, only 2 of 8 patients who did not undergo *H. pylori* eradication during the preoperative period had unremitting symptoms during the postoperative period. Only three of 100 patients who did not receive a UGI endoscopy during the preoperative period had unremitting symptoms during the postoperative period. The main outcome of the study is to evaluate the necessity of performing routine UGI endoscopy before cholecystectomy. Our results show that it is not necessary, because if you take biliary colic as the one and only symptom of indication for cholecystectomy, the ratio of postcholecystectomy syndrome is 3% to 5% and the reason is 50% organic.

Key words: Endoscopy – Cholelithiasis – Cholecystectomy

Corresponding author: Emre Gunay, MD, Tibbiye Cad. Haydarpasa Numune Egitim ve Arastirma Hastanesi Genel Cerrahi Klinigi Uskudar Istanbul, Turkey.
Tel.: +90 532 498 23 13; E-mail: emregunay2000@yahoo.com

As some patients have overlapping symptoms of biliary and gastroduodenal pathologies, no symptomatic relief can be achieved with cholecystectomy.[1] This condition is also known as postcholecystectomy syndrome. This term is used to describe a heterogeneous patient group with ongoing symptoms after cholecystectomy. It is not a real syndrome; the term is rather misleading. The cause of lack of complete relief after cholecystectomy is usually the wrong preoperative diagnosis of chronic cholecystitis. The only symptom entirely characteristic for chronic cholecystitis is biliary colic. The symptoms may persist without a change after the operation if cholecystectomy is performed with a view of relief of symptoms including dyspepsia or intolerance to fatty foods. The causes of the syndrome may include gastroduodenitis,[2] incomplete stone extraction, biliary stasis, inflammation, and strictures. A cystic canal remnant >1 cm, also called residual ductus, may predispose to symptoms of chronic postcholecystectomy.[3]

At our unit, patients scheduled for cholecystectomy with nonspecific symptoms undergo routine upper gastrointestinal (UGI) endoscopy. The aim of this study was to assess the effectiveness of UGI endoscopy in reducing the possibility of postcholecystectomy syndrome.

Materials and Method

This retrospective study was conducted between November 2011 and December 2012. A total of 194 cholecystectomy operations were performed.

In patients sampled for histopathologic examination in routine UGI endoscopy before cholecystectomy, screening for *Helicobacter pylori* and intestinal metaplasia was carried out with Giemsa stain and PAS–Alcian stain, respectively. Biopsy specimen is combined with urea and pH is measured (rapid urease test). *H. pylori* converts urea to ammonia (NH3 + CO2). Test is positive for *H. pylori* if pH of the medium becomes more alkaline, indicated by color change. Histology offers additional information on degree and pattern of inflammation.

Patients who did not undergo UGI endoscopy before operation were designated as Group A (n = 100), and those who underwent routine UGI endoscopy before operation were called Group B (n = 94).

Statistical Analysis

For statistical analyses, NCSS (Number Cruncher Statistical System), 2007&PASS (Power Analysis and Sample Size), and 2008 Statistical Software (Kaysville, Utah) software packages were used. Descriptive statistical methods (mean, SD, median, frequency, ratio) were used to describe study data, and Student's *t* test was used to compare normally distributed data. Yates' correction for continuity was used to compare qualitative data. The significance level was accepted as $P < 0.01$ and $P < 0.05$.

Results

Between November 2011 and December 2012, the study was conducted in 194 cases of which 23.2% (n = 45) were male, and 76.8% (n = 149) were female. The age range of the cases was 19 years to 86 years, and the mean age was 50.48 ± 14.38 years.

Of 94 patients who underwent routine endoscopy before operation, 39 (41.5%) were diagnosed with *H. pylori* positivity as a result of examination of histopathologic samples obtained from antrum. Thirty-one of these 39 patients were administered *H. pylori* eradication treatment. Seven (22.6%) of 31 patients undergoing *H. pylori* eradication during preoperative period had ongoing symptoms at the postoperative period. On the other hand, only 2 (25%) of 8 patients who did not undergo *H. pylori* eradication during the preoperative period had unremitting symptoms during the postoperative period (Fig. 1). Only three (3%) of 100 patients who did not receive UGI endoscopy during the preoperative period had unremitting symptoms during the postoperative period (Table 1).

There were no significant differences between the groups with respect to mean age, gender, and rates of postcholecystectomy syndrome according to endoscopic status ($P > 0.05$) (Table 2).

A significant difference was detected between the groups with respect to mean age ($P < 0.05$) such that the *H. pylori* (–) group had a significantly higher mean age compared with *H. pylori* (+) cases. There were no significant differences between the groups in terms of gender ($P > 0.05$; Table 3).

Discussion and Conclusion

The results of our clinical trial suggest that there is no difference between patients who undergo routine UGI endoscopy at the preoperative period and

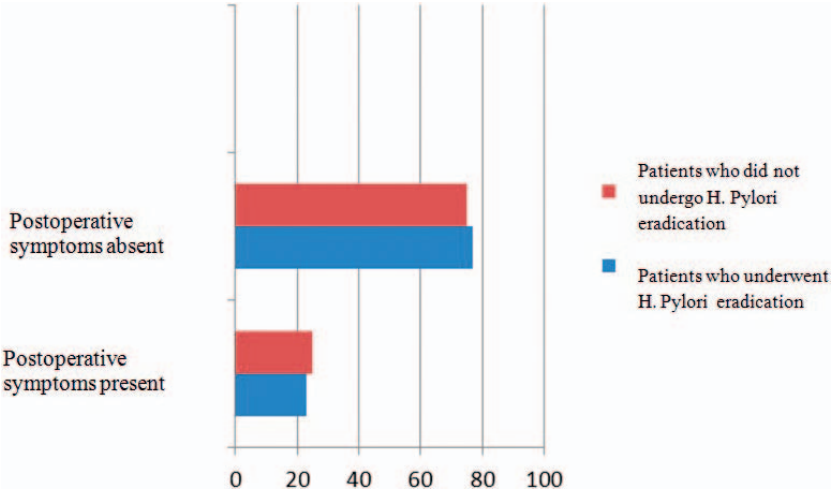

Fig. 1 Rate of postoperative symptoms according to *H. pylori* eradication status.

patients who do not undergo such a procedure with respect to symptom persistence at postoperative period. The reason for this condition is probably the consideration of biliary colic as the sole absolute indication of cholecystectomy.

In our study, 22.6% of patients undergoing *H. pylori* eradication during the preoperative period had ongoing symptoms at the postoperative period. On the other hand, 25% of patients who did not undergo *H. pylori* eradication during the preoperative period had unremitting symptoms during the postoperative period. That means there is not a significant relationship between *H. pylori* eradication and postcholecystectomy syndrome. Caldwell *et al* reported that the number of patients with *H. pylori* infection increases from preoperatively to postcholecystectomy due to the association between cholecystectomy and the increase in the percentage time gastric pH.[4]

Ergim *et al* reported that gastroduodenitis was the most common cause of postcholecystectomy syndrome.[2] Another study pointed out that the symptoms commonly arise as a result of inadequate surgical measures (a residual choledochal stone, residues of cystic duct or gall bladder, an unnoticed malignancy, intrahepatic stones, biliary fistula, surgical trauma-induced biliary tree strictures, and Oddi's sphincter stenosis).[5]

The cause of the postcholecystectomy syndromes is not a single specific entity. In 5% of cases, postoperative symptoms may develop despite a robust cholecystectomy indication. This group represents the actual postcholecystectomy syndromes.

Literature data suggest that the rate of mild or severe postoperative symptoms (including dyspepsia and postprandial pressure sensation in epigastrium, severe epigastric pain accompanying jaundice, and cholangitis) is 4% to 40%.

Cystic duct lithiasis (CDL) is found frequently during cholecystectomy; CDL is often associated with preoperative pain, abnormal liver function tests, and choledocholithiasis. It can persist despite preoperative sphincterotomy. The search for and treatment of CDL should be routinely performed during cholecystectomy.[6]

A cystic duct remnant is defined as a residual duct >1 cm; it may predispose to chronic postcholecystectomy symptoms. The laparoscopic removal with complete cystic duct remnant excision is a definitive cure of chronic painful symptoms.[3]

Gallbladder remnant containing stones may be the cause of otherwise unexplained postcholecystectomy pain. Completion cholecystectomy offers a

Table 1 Distribution of descriptive features

	Min–Max	Mean ± SD
Age (years)	19–86	50.48 ± 14.38
	n	%
Gender		
Male	45	23.2
Female	149	76.8
Endoscopic status		
Endoscopy (−)	100	51.5
Endoscopy (+)	94	48.5
Helicobacter pylori		
H.P. (−)	54	58.5
H.P. (+)	39	41.5
Preoperative treatment	31	15.9
Postoperative symptom	12	6.2

Table 3 Assessment of demographic characteristics in cases that underwent endoscopy (n = 94)

	Helicobacter pylori		
	H.P. (−) (n = 55) Mean ± SD	H. P. (+) (n = 39) Mean ± SD	*P*
Age (years)	53.41 ± 12.98	46.87 ± 1.13	[a]0.028*
	n (%)	n (%)	
Gender			
Female	11 (20%)	11 (28.2%)	[b]0.529
Male	44 (80%)	28 (71.8%)	

[a]Student's *t* test.

[b]Yates' correction for continuity.

*$P < 0.05$

definitive treatment for any residual gallbladder remnant and can be performed laparoscopically.[7]

The therapeutic approach in patients with sphincter of Oddi (SO) dysfunction (SOD) aims to reduce the resistance to the flow of bile or pancreatic juice. Vardenafil inhibits the activity of phosphodiesterase type 5 (PDE–5), which degrades cyclic guanosine monophosphate (cGMP) and results in relaxation of smooth muscle. Although vardenafil inhibits SO motility in patients with suspected SOD and reduces basal SO pressure, it does not have significant adverse effects.[8]

Steffen reported a case of a metal clip as a nidus for formation of common bile duct stone 2 years after laparascopic cholecystectomy.[9] Surgical nonabsorbable sutures can act as a nidus for symptomatic common bile duct (CBD) stones.[10] However, migrated suture material per se, without stone formation and causing symptoms, has been reported in only 1 patient in the English-language literature, back in 1977.[11] Das reported the second case of suture material without stone formation in the common bile duct causing recurrent postcholecystectomy pain in 2010.[12]

In only 50% of cases an organic disorder is present.[5,13] Many patients with gastroparesis have had their gallbladders removed. Symptom profiles in patients with and without cholecystectomy differ: postcholecystectomy gastroparesis patients had more severe upper abdominal pain and retching and less severe constipation. These data suggest that prior cholecystectomy is associated with selected manifestations of gastroparesis.[14]

In conclusion, it is important to note that cholelithiasis is responsible for 85% of biliary diseases.[15] Cholecystectomy is the most common operation performed in the biliary system, which may or may not be performed with evaluation of the common bile duct or UGI system. Postcholecystectomy syndrome develops in 3% to 5% of cases, and an organic etiology can be detected in only 50% of them. Therefore, as our study also suggested, it would be prudent to perform an UGI endoscopy in selected cases (cases having dyspepsia rather than biliary colic, the characteristic symptom of chronic cholecystitis; and a group of patients with more nonspecific symptoms, such as intolerance to fatty food) before cholecystectomy rather than routinely performing it in all patients.

Acknowledgments

There are not any grants or support for this study. Equipment (*e.g.*, endoscopes, surgical equipment, etc.) at Haydarpasa Numune Research Hospital was used.

Table 2 Assessment of age, gender, and postcholecystectomy measurements in terms of endoscopic status

	Endoscopic Status		
	Endoscopy (+) (n = 94) Mean ± SD	Endoscopy (−) (n = 100) Mean ± SD	*P*
Age (years)	50.99 ± 14.49	50.01 ± 14.34	[a]0.637
	n (%)	n (%)	
Gender			
Female	71 (75.5%)	78 (78.0%)	[b]0.813
Male	23 (24.5%)	22 (22.0%)	
Postcholecystectomy Syndrome	8 (8.5%)	3 (3.0%)	[b]0.178

[a]Student's *t* test.

[b]Yates' correction for continuity.

References

1. Rashid F, Rashid N, Waraich N, Ahmed J, Iftikhar SY. Role of routine oesophago-gastroduodenoscopy before cholecystectomy. *Int J Surg* 2010;**8**(3):236–238
2. Erdem E, Surgurtekin U, Neşşar M. Postcholecystectomy syndrome after acute and elective laparoscopic cholecystectomy. *Ulus Travma Acil Cerrahi Derg* 1998;**4**(1):23–27
3. Selvaggi F, Di Bartolomeo N, De Iuliis I, Del Ciotto N, Innocenti P. Laparoscopic treated so-called reformed gallbladder in patient with postcholecystectomy chronic pain. *G Chir* 2011;**32**(6-7):335–337
4. Caldwell MT, McDermott M, Jazrawi S, O'Dowd G, Byrne PJ, Walsh TN. Helicobacter pylori infection increases following cholecystectomy. *Ir J Med Sci* 1995;**164**(1):52–55
5. Tondelli P, Gyr K. Biliary tract disorders. Postsurgical syndromes. *Clin Gastroenterol* 1983;**12**(1):231–254
6. Sezeur A, Akel K. Cystic duct remnant calculi after cholecystectomy. *J Visc Surg* 2011;**148**(4):287–290
7. Parmar AK, Khandelwal RG, Mathew MJ, Reddy PK. Laparoscopic completion cholecystectomy: a retrospective study of 40 cases. *Asian J Endosc Surg* 2013;**6**(2):96–99
8. Cheon YK, Cho YD, Moon JH, Im HH, Jung Y, Lee JS. Effects of vardenafil, a phosphodiesterase type-5 inhibitor, on sphincter of Oddi motility in patients with suspected biliary sphincter of Oddi dysfunction. *Gastrointest Endosc* 2009;**69**(6):1111–1116
9. Steffen M, Kronsbein H, Wesche L. Metal clip as a nidus for formation of common bile duct stone following laparascopic cholecystectomy. *Z Gastroenterol* 2007;**45**(4):317–319
10. Ban JL, Hirase FM, Benfield JR. Foreign bodies of the biliary tract: report of two patients and a review of the literature. *Ann Surg* 1972;**176**(1):102–107
11. Rees BI, Jacob G. Silk sutures in the common bile duct. *Br Med J* 1977;**2**(6097):1265
12. Das K, Basu K, Ray S, Chatterjee S. Suture material in the common bile duct causing recurrent post-cholecystectomy pain. *Endoscopy* 2010;**42**(2):258
13. Aran O, Sayek I. Surgical treatment of benign biliary strictures. *Turkiye Klinikleri J Med Res* 1986;**4**(1):91–93
14. Parkman HP, Yates K, Hasler WL, Nguyen L, Pasricha PJ, Snape WJ. Cholecystectomy and clinical presentations of gastroparesis. *Dig Dis Sci* 2013;**58**(4):1062–1073
15. Rigo M, Mosimann R, Ryncki P, Seagesser F. Surgical pathology of gallbladder and biliary tract. A retrospective study of 4363 observations. *Helv chir acta* 1974;**41**(5-6):533–536