

Incidental gall bladder cancers: Are they truly incidental?

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Abstract

AIM: To seek and analyze features suggestive of gallbladder cancer (GBC) on preoperative imaging and intraoperative findings in patients diagnosed as having incidental GBC (IGBC).

METHODS: The study was conducted on 79 patients of IGBC managed in our department over a 10-year period (2003-2012). Review of preoperative imaging and operative notes was done to ascertain any suspicion of malignancy-in-retrospect.

RESULTS: Of the 79 patients, Ultrasound abdomen showed diffuse thickening, not suspicious of malignancy in 5 patients, and diffuse suspicious thickening was seen in 4 patients. Focal thickening suspicious of malignancy was present in 24 patients. Preoperative computed tomography/magnetic resonance imaging was done in 9 patients for suspicion of malignancy. In 5 patients, dif-

ficult Cholecystectomy was encountered due to dense/inflammatory adhesions. Intraoperative findings showed focal thickening of the gallbladder and a gallbladder mass in 9 and 17 patients respectively. On overall analysis, 37 patients had preoperative imaging or intraoperative findings suggestive of malignancy, which was either a missed GBC or an unsuspected/unexpected GBC. In 42 (53.2%) patients, there was no evidence suggestive of malignancy and was an unanticipated diagnosis.

CONCLUSION: Our study highlights a potential and not-so-rare pitfall of Laparoscopic Cholecystectomy. A greater awareness of this clinical entity along with a high index of suspicion and a low threshold for conversion to open procedure, especially in endemic areas may avert avoidable patient morbidity and mortality.

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Key words: Incidental gallbladder cancer; Preoperative detection; Imaging

Core tip: The true incidence of incidental gallbladder cancer (IGBC) in literature appears skewed as the preoperative and intraoperative clues towards malignancy may be missed. We aimed to seek and analyze features suggestive of GBC on preoperative imaging and intraoperative findings in patients diagnosed as having IGBC. On overall analysis, 37 patients had preoperative imaging or intraoperative findings suggestive of malignancy, which was either a missed GBC or an unsuspected/unexpected GBC. A greater awareness of this clinical entity along with a high index of suspicion and a low threshold for conversion to open procedure, may avert avoidable patient morbidity and mortality.

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Table 1 Preoperative radiology

Radiology	n (%)
Ultrasonogram - diffuse suspicious thickening	4 (5.1)
Ultrasonogram - diffuse thickening not suspicious of malignancy	5 (6.3)
Ultrasonogram - focal Thickening	24 (30.4)
CT/MRI - suspicious lesion	9 (11.4)
Non specific	42 (53.2)

CT: Computed tomography; MRI: Magnetic resonance imaging.

INTRODUCTION

Laparoscopic cholecystectomy (LC) has been the gold standard treatment for gallstone disease for over two decades. LC performed for gallstone disease may rarely result in a diagnosis of unexpected gallbladder cancer^[1-3]. Incidental gallbladder cancer (IGBC) may be defined as a malignancy detected only on histopathological examination without prior pre-operative or intra-operative suspicion of malignancy^[4]. The incidence of gallbladder cancer diagnosed during or after LC is 0.2%-2.85%. With ever increasing numbers of laparoscopic cholecystectomies being performed worldwide, an incidental diagnosis of gallbladder carcinoma is also becoming more frequent^[1,2,4,5-9]. In patients with IGBC, many will have residual disease, and their survival may be worse as compared to those who have undergone a radical procedure as the index surgery; thus a preoperative diagnosis of GBC is imperative^[10-12]. The aim of the study was to seek and analyze features suggestive of GBC on preoperative imaging and intraoperative findings in patients diagnosed as having IGBC.

MATERIALS AND METHODS

An analysis from a prospectively collected database of patients admitted in our department with a diagnosis of IGBC following a Laparoscopic/Laparoscopy converted to open cholecystectomy for gallstone disease between Jan 2003 and Dec 2012 was done. The group consisted of patients who had undergone the index cholecystectomy either in our unit or elsewhere. All histological reports and slides were reviewed and verified to confirm the presence of gallbladder cancer. Over a 10-year period (2003-2012), 79 patients were operated for IGBC. Their preoperative radiological findings and operative notes were reviewed to ascertain any suspicion of malignancy-in-retrospect.

RESULTS

Diffuse thickening not suspicious of malignancy and diffuse suspicious thickening of the gallbladder were seen in 5 and 4 patients respectively on ultrasound abdomen. Suspicious focal thickening was observed in 24 patients. 53.2% of the patients had unremarkable preoperative imaging (Table 1). In 5 patients, a difficult Cholecystectomy

Table 2 Intraoperative findings

Intraoperative findings	n (%)
Focal thickening of gallbladder	9 (11.4)
Gallbladder mass	17 (21.5)
Difficult cholecystectomy (dense/inflammatory adhesions)	5 (6.3)
Uneventful	48 (60.1)
Conversion to open cholecystectomy	5 (6.3)

was encountered due to dense/inflammatory adhesions. Intraoperative findings of a focal thickening of the gallbladder and a gallbladder mass were observed in 9 and 17 patients respectively (Table 2). Five patients needed conversion to open cholecystectomy, an incidence of 6.3% which was far higher than our unit's conversion rate from laparoscopic to open cholecystectomy of 1.3%. On overall analysis, 37 patients had preoperative imaging or intraoperative findings suggestive of malignancy, which was either a missed GBC or an unsuspected/unexpected GBC. On the contrary in 42 (53.2%) patients, there was no pre/peroperative evidence suggestive of malignancy and IGBC was a histological surprise (Table 3).

DISCUSSION

Stage matched outcomes following surgery for IGBC may be significantly worse than those operated with an initial diagnosis GBC; therefore, a preoperative diagnosis is imperative and helps decrease long term morbidity and mortality^[2,4-13].

Due to its myriad presentations, the radiological and clinical features of gallstone disease may mask GBC; making a preoperative diagnosis of GBC in these patients difficult. Both entities may have similar clinical features such as those suggestive of acute or chronic cholecystitis and radiological findings such as thickening of the gallbladder wall and/or polyps^[2,10,14,15]. In our study, 46.8% of the patients had subtle signs suggestive of a pathology other than gallstone disease, which were overlooked during the index surgery. Preoperative identification of patients at a higher risk of IGBC like those with gallbladder polyps or a mass on imaging, might forewarn a surgeon, and allow for the performance of an adequate R0 resection at the initial procedure or a possible referral to a center with expertise in liver surgery^[1,2,4]. Intraoperatively, a difficult cholecystectomy, should raise the suspicion of an IGBC especially in endemic areas^[8,14,15]. Operative management should be appropriately altered based on intraoperative findings and a liberal application of frozen section examination. In our series, there was a significantly higher rate of conversion to open cholecystectomy in patients with IGBC who had their index operation at our institute as compared to our standard conversion rate.

A combination of clinical and radiological factors combined with a liberal application of intraoperative frozen section examination can help guide the surgeon towards a structured and rationalized management of IGBC. Differentiating IGBC from gallstone disease is a

Table 3 Preoperative suspicion of gallbladder cancer

Incidental gallbladder cancer - pre/intraoperative picture	n (%)
Suggestive of malignancy	37 (46.8)
Unanticipated diagnosis	42 (53.2)

diagnostic conundrum. Making this distinction preoperatively or intraoperatively may be difficult and a definitive diagnosis still necessitates a histopathological examination. An accurate preoperative diagnosis requires an integrated review of clinical and characteristic radiological features, the presence of which may help guide surgery and prevent avoidable morbidity in selected cases.

In conclusion, our results showcase a potential and not-uncommon hazard of Laparoscopic Cholecystectomy. A better understanding along with a heightened suspicion and a low threshold for conversion to an open procedure particularly in endemic areas will help avoid preventable patient morbidity and mortality.

COMMENTS

Background

Incidental Gallbladder cancer (IGBC) is defined as cancer detected for the first time on histopathological examination with no pre-operative or intra-operative suspicion of malignancy. With the wide acceptance of laparoscopic cholecystectomy, an incidental diagnosis of gallbladder carcinoma is becoming more frequent.

Research frontiers

However, the true incidence of IGBC in literature appears skewed as the pre-operative and intraoperative clues towards malignancy may be missed. The authors aimed to seek and analyze features suggestive of GBC on preoperative imaging and intraoperative findings in patients diagnosed as having IGBC.

Innovations and breakthroughs

On overall analysis, 37 patients had preoperative imaging or intraoperative findings suggestive of malignancy, which was either a missed GBC or an unsuspected/unexpected GBC. In 42 (53.2%) patients, there was no evidence suggestive of malignancy and was an unanticipated diagnosis.

Applications

This study highlights a potential and not-so-rare pitfall of Laparoscopic Cholecystectomy. A greater awareness of this clinical entity along with a high index of suspicion and a low threshold for conversion to open procedure, especially in endemic areas may avert avoidable patient morbidity and mortality.

Terminology

IGBC is defined as cancer detected for the first time on histopathological examination with no pre-operative or intra-operative suspicion of malignancy.

Peer review

The authors have written an interesting paper regarding the incidental gall bladder cancers. Overall the paper is well organized and quite educative giving new information. This study highlights a potential and not-so-rare pitfall of Laparoscopic Cholecystectomy and suggests that it is necessary a greater awareness of this clinical entity and so could prevent avoidable patient morbidity and mortality.

REFERENCES

- Pitt SC, Jin LX, Hall BL, Strasberg SM, Pitt HA. Incidental gallbladder cancer at cholecystectomy: when should the

surgeon be suspicious? *Ann Surg* 2014; **260**: 128-133 [PMID: 24509205 DOI: 10.1097/SLA.0000000000000485]

- Steinert R, Nestler G, Sagynaliev E, Müller J, Lippert H, Reymond MA. Laparoscopic cholecystectomy and gallbladder cancer. *J Surg Oncol* 2006; **93**: 682-689 [PMID: 16724350 DOI: 10.1002/jso.20536]
- Ingraham AM, Cohen ME, Ko CY, Hall BL. A current profile and assessment of north american cholecystectomy: results from the american college of surgeons national surgical quality improvement program. *J Am Coll Surg* 2010; **211**: 176-186 [PMID: 20670855 DOI: 10.1016/j.jamcollsurg.2010.04.003]
- Isambert M, Leux C, Métairie S, Paineau J. Incidentally-discovered gallbladder cancer: When, why and which reoperation? *J Visc Surg* 2011; **148**: e77-e84 [PMID: 21478068 DOI: 10.1016/j.jviscsurg.2011.02.005]
- Yamamoto H, Hayakawa N, Kitagawa Y, Katohno Y, Sasaya T, Takara D, Nagino M, Nimura Y. Unsuspected gallbladder carcinoma after laparoscopic cholecystectomy. *J Hepatobiliary Pancreat Surg* 2005; **12**: 391-398 [PMID: 16258808]
- Kwon AH, Imamura A, Kitade H, Kamiyama Y. Unsuspected gallbladder cancer diagnosed during or after laparoscopic cholecystectomy. *J Surg Oncol* 2008; **97**: 241-245 [PMID: 18095299 DOI: 10.1002/jso.20944]
- Kim JH, Kim WH, Kim JH, Yoo BM, Kim MW. Unsuspected gallbladder cancer diagnosed after laparoscopic cholecystectomy: focus on acute cholecystitis. *World J Surg* 2010; **34**: 114-120 [PMID: 19898893 DOI: 10.1007/s00268-009-0279-9]
- Zhang WJ, Xu GF, Zou XP, Wang WB, Yu JC, Wu GZ, Lu CL. Incidental gallbladder carcinoma diagnosed during or after laparoscopic cholecystectomy. *World J Surg* 2009; **33**: 2651-2656 [PMID: 19760311 DOI: 10.1007/s00268-009-0218-9]
- Pawlik TM, Gleisner AL, Vigano L, Kooby DA, Bauer TW, Frilling A, Adams RB, Staley CA, Trindade EN, Schulick RD, Choti MA, Capussotti L. Incidence of finding residual disease for incidental gallbladder carcinoma: implications for re-resection. *J Gastrointest Surg* 2007; **11**: 1478-1486; discussion 1486-1487 [PMID: 17846848 DOI: 10.1007/s11605-007-0309-6]
- Clemente G, Nuzzo G, De Rose AM, Giovannini I, La Torre G, Ardito F, Giuliani F. Unexpected gallbladder cancer after laparoscopic cholecystectomy for acute cholecystitis: a worrisome picture. *J Gastrointest Surg* 2012; **16**: 1462-1468 [PMID: 22653330 DOI: 10.1007/s11605-012-1915-5]
- Butte JM, Waugh E, Meneses M, Parada H, De La Fuente HA. Incidental gallbladder cancer: analysis of surgical findings and survival. *J Surg Oncol* 2010; **102**: 620-625 [PMID: 20721958 DOI: 10.1002/jso.21681]
- Genç V, Onur Kirmker E, Akyol C, Kocaay AF, Karabörk A, Tüzün A, Erden E, Karayalçın K. Incidental gallbladder cancer diagnosed during or after laparoscopic cholecystectomy in members of the Turkish population with gallstone disease. *Turk J Gastroenterol* 2011; **22**: 513-516 [PMID: 22234759]
- Choi SB, Han HJ, Kim CY, Kim WB, Song TJ, Suh SO, Kim YC, Choi SY. Incidental gallbladder cancer diagnosed following laparoscopic cholecystectomy. *World J Surg* 2009; **33**: 2657-2663 [PMID: 19823903 DOI: 10.1007/s00268-009-0249-2]
- Koshenkov VP, Koru-Sengul T, Franceschi D, Dipasco PJ, Rodgers SE. Predictors of incidental gallbladder cancer in patients undergoing cholecystectomy for benign gallbladder disease. *J Surg Oncol* 2013; **107**: 118-123 [PMID: 22886779 DOI: 10.1002/jso.23239]
- Solaini L, Sharma A, Watt J, Iosifidou S, Chin Aleong JA, Kocher HM. Predictive factors for incidental gallbladder dysplasia and carcinoma. *J Surg Res* 2014; **189**: 17-21 [PMID: 24589178 DOI: 10.1016/j.jss.2014.01.064]

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