Port-Site Metastasis From Gallbladder Carcinoma After Laparoscopic Cholecystectomy, Report Of Three Cases
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Citation

Abstract
In the last few years, an increasing number of reports of port-site metastasis from unsuspected gallbladder cancer was published and a lot of concern has been expressed that laparoscopic cholecystectomy might adversely affect the prognosis of gallbladder cancer by increasing the risk of port-site and peritoneal seeding. The best prevention of this complication is early (preoperative) diagnosis of gallbladder cancer but this is not always possible. Cases of gallbladder carcinoma diagnosed or suspected preoperatively should be operated by open surgery rather than by laparoscopic surgery. Conversion to open cholecystectomy is appropriate if cancer is suspected during laparoscopic cholecystectomy. If gallbladder cancer is diagnosed postoperatively on histological examination of the gallbladder specimen, surgical and adjuvant radiotherapy to the trocar sites in association with extended treatment to the gallbladder bed and adjacent areas is advisable.

INTRODUCTION
In the last few years, an increasing number of case reports of port-site metastases following laparoscopic cholecystectomy for unsuspected carcinoma of the gallbladder was published. Concern has been expressed that laparoscopic cholecystectomy might adversely affect the prognosis of gallbladder cancer by increasing the risk of port-site and peritoneal seeding. We report three cases of port-site metastasis after laparoscopic cholecystectomy. We also review the literature for port-site metastasis from unsuspected gallbladder carcinoma.

THE FIRST CASE
A 51-year-old male presented to the surgical outpatient department at KFMRC, Riyadh, KSA, with swelling at the epigastrium for 2 months associated with yellowish discoloration of the skin and sclera and significant weight loss (17 kg in 4 months) (Fig. 1). He had had laparoscopic cholecystectomy for gallstones at another hospital 10 months before his presentation. He did not know nor had any record of the histopathology of the gallbladder.

On examination, he was jaundiced. Abdominal examination revealed a hard mass of 4 x 6cm at the site of the epigastric port. There was no hepatomegaly or ascites.

Laboratory investigations showed a hemoglobin of 12.7 g/dl, a WBC of 6.5 x 10³, an albumin of 27 g/l and a total bilirubin of 223.9 IU/l with a direct bilirubin of 189 IU/l. Abdomen/chest CT scan showed an ill-defined lesion with heterogeneous enhancement, a cystic component and areas of calcification in the epigastric region just below the sternum. The lesion was extending deep to involve the anterior surface of the liver (segment VI).
There were multiple enlarged lymph nodes in the peripancreatic area (Fig. 2).

**Figure 2**
Figure 2: The chest and abdominal CT scan showing a lesion with ill-defined margins, cystic component, and areas of calcification in the lower chest wall just below the level of the sternum.

The percutaneous core biopsy from the mass showed moderately to poorly differentiated adenocarcinoma.

The patient had successful endoscopic stenting of the common bile duct (by metallic stent) (Fig. 3) with dramatic clearance of his jaundice. He was referred to the oncology department for palliative chemotherapy.

**Figure 3**
Figure 3: Abdominal X-ray showing the endoscopic metallic stent in the common bile duct.

**THE SECOND CASE**
A 45-year-old Yemeni female who underwent laparoscopic cholecystectomy for what proved histologically to be unsuspected poorly differentiated adenocarcinoma of the gallbladder presented 4 months after surgery with mass at the epigastric port site associated with jaundice, persistent vomiting and weight loss.

On examination, she was pale and jaundiced. Abdominal examination revealed a hard mass of 8 x 7 cm in the epigastric port site. The liver was enlarged with a distinct palpable large mass in the right hypochondrium. There was no ascites.

Laboratory investigations showed a hemoglobin of 9.05 g/dl, a WBC of 11 x 10³, an albumin of 22 g/L and a total bilirubin of 79.8 IU/l with a direct bilirubin of 62 IU/l. The ultrasound of the abdomen showed a large echogenic soft-tissue mass lesion measuring 6.6 x 6.6 cm at the gall bladder fossa (Fig. 4).

**Figure 4**
Figure 4: The abdominal ultrasound showing a large echogenic soft-tissue mass occupying the entire gall bladder fossa and partially involving the main portal vein with a small liver lesion.

The abdominal CT scan showed a heterogeneous complex mass measuring 6.7 x 6.6 cm seen at the gallbladder fossa with multiple hypodense areas consistent with necrosis. The mass had a mass effect upon the main portal vein with subsequent invasion and evidence of tumor thrombosis at the confluence of the right portal vein with invasion of the IVC and multiple liver metastases (Fig. 5, 6, 7).

The mass appeared inseparable from the pancreatic head.
Another soft-tissue mass of heterogeneous density was seen at the site of the previous laparoscopic port and extended to the peritoneal fold on the right side, consistent with peritoneal seeding of the tumor. Percutaneous biopsy confirmed a poorly differentiated adenocarcinoma.

**Figure 5**
Figure 5: The abdominal CT scan (axial view) showing a heterogeneous complex mass at the gallbladder fossa and another mass at the epigastric port site.

![Figure 5](image)

**Figure 7**
Figure 7: The abdominal CT scan (axial view) showed multiple hypodense lesions of variable size scattered over the liver with the largest seen at segment VII, most likely representing hepatic metastatic lesions.

Then the patient had upper GI endoscopy which showed severe gastric outlet obstruction due to the mass effect on the pylorus and first part of the duodenum. He had a duodenal and a common bile duct stent (Fig. 8) and was referred to oncology for palliative chemotherapy.

**Figure 6**
Figure 6: The abdominal CT scan (axial view) showing a heterogeneous complex nodal mass with multiple hypodense areas consistent with necrosis. The mass invades the IVC and appears inseparable from the head of the pancreas.

![Figure 6](image)
Figure 8
Figure 8: The abdominal CT scan (sagittal view) showing the duodenal and biliary stents.

Ultrasound-guided percutaneous biopsy from both liver and umbilical lesions showed moderately to poorly differentiated adenocarcinoma.

THE THIRD CASE

A 56-year-old lady was referred to the outpatient department because of recurrent attacks of right hypochondrial pain associated with progressive loss of weight (more than 25 kg in 6 months). She gave a history of cholecystectomy for gallstone in another country 2 years before her presentation. She was a known diabetic and hypertensive on medical treatment.

On examination, she was not anemic or jaundiced with normal vital signs. Abdominal examination revealed a small hard mass at the umbilicus and a huge palpable mass in the right hypochondrium associated with diffuse hepatomegaly.

Laboratory investigations showed a hemoglobin of 11.8 g/dl, a WBC of 8.17 x 10³, an albumin of 20 g/l, a total bilirubin of 20.6 IU/l and a direct bilirubin of 4.7 IU/l. Alpha-fetoprotein and CA 19-9 were markedly elevated.

The abdominal CT scan showed hypervascular liver lesions of varying sizes, which were involving almost all hepatic segments together with an enhancing hypervascular subcutaneous nodule at the umbilicus (Fig. 9, 10).

DISCUSSION

Laparoscopic cholecystectomy is considered as the gold standard operation for removal of the gallbladder, and has several advantages over the traditional open cholecystectomy. However, in the last few years there is an increasing number of case reports of port-site metastases following laparoscopic cholecystectomy for unsuspected carcinoma of the gallbladder (1).
Concern has been expressed that laparoscopic cholecystectomy might adversely affect the prognosis of gallbladder cancer by increasing the risk of port-site and peritoneal seeding (2, 3, 4). These potentially lethal complications would seem to occur more frequently after laparoscopic cholecystectomy than after open cholecystectomy (5), although a recent multicenter evaluation suggested that the prognosis after laparoscopic cholecystectomy was not significantly different from that reported in the literature after open cholecystectomy (6). The reason for such a diversity of opinions can be explained by the extreme lack of homogeneity among the various evaluations (7), but it reflects the importance of preoperative diagnosis of gallbladder carcinoma.

Unfortunately, the preoperative diagnosis of early stages of gallbladder carcinoma is difficult due to its non-specific symptoms. The symptoms of gallbladder cancer overlap with the symptoms of gallstones and biliary colic. Sonography is a routinely requested technique for investigating patients with gallbladder symptoms (8, 9, and 10), has a relatively high sensitivity for the detection of gallbladder carcinoma at advanced stages, but it is limited in the diagnosis of early lesions. Although CT scan is a valuable investigation for suspected cases of gallbladder carcinoma with a reported sensitivity of 80% and 100%, it is not routinely used to investigate patients with gallbladder disease symptoms. Preoperative diagnosis depends mainly on a high index of clinical suspicion especially in elderly patients with gallstones. Some authors (11) suggested criteria for early diagnosis of gallbladder cancer in presence of the combination of female sex, old age, silent gallstones presenting at late age, abnormal liver function test and thickened wall of the gallbladder on ultrasonic examination (plus criteria), but these criteria are not yet critically evaluated.

The difficulty of preoperative diagnosis together with the difficulty in identifying gallbladder cancer during laparoscopic cholecystectomy resulted in a large number of reports of port-site metastasis of unsuspected gallbladder carcinoma.

One percent of patients undergoing cholecystectomy for cholelithiasis have an incidental gallbladder carcinoma (12), diagnosed either intra-operatively or subsequent to histological analysis following cholecystectomy (13).

The phenomenon of port-site metastasis from an intra-abdominal malignancy after laparoscopic surgery is well documented (14-18). However, the etiology of this form of metastasis remains unclear. Several possible factors are probably involved in the development of such metastases (19). Tumor implantation at the port site during removal of the abdominal viscera is one widely accepted theory (20). Tumor implantation to the effects of carbon dioxide usage has also been implicated (19).

Z'graggen et al. (21) analyzed thirty-seven patients who were unknown to have adenocarcinoma of the gallbladder preoperatively. The patients were part of a large prospective study of the Swiss Association of Laparoscopic and Thoracoscopic Surgery including 10,925 patients undergoing laparoscopic cholecystectomy. They found that the incidence of recurrence of carcinoma at the port site in these patients is 14% (5 of 37) and is similar whether the primary tumor is confined to the gallbladder (T1/T2) or locally advanced (T3/T4). They concluded that patients who are preoperatively undiagnosed to have adenocarcinoma of the gallbladder and undergo laparoscopy or laparoscopic cholecystectomy have a high incidence of recurrences at the port site, and the incidence increases when a gallbladder perforation occurs during the operation.

Many authors agree that until the effect of laparoscopy on the spread of this tumor is better understood and controlled, open operation should be performed when carcinoma of the gallbladder is diagnosed or suspected preoperatively (22).

Many authors suggested if malignancy is encountered unexpectedly during laparoscopic cholecystectomy, the procedure should be converted to an open resection to allow for appropriate evaluation of the stage of disease and appropriate surgical management (23, 24, and 25).

Some authors suggested that if the possibility of gallbladder carcinoma cannot be completely excluded, laparoscopic cholecystectomy should be performed by the abdominal-wall lifting method and a protective bag should be used for the removal of the gallbladder (26).

When laparoscopic cholecystectomy is done for inapparent gallbladder cancer, surgical and adjuvant radiotherapy to the trocar sites appears to improve the outcome in association with extended treatment to the gallbladder bed and adjacent areas. Recent reports suggest that progress in diagnostic, surgical, and adjuvant techniques could substantially improve survival in carcinoma of the gallbladder (22).
Port-site recurrence does not mean an incurable stage of the disease or a sign of diffuse metastases. Even after re-excision of abdominal wall metastases patients might be free from other detectable recurrences (27).

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