Laparoscopic cholecystectomy is a surgical procedure of choice for benign gallbladder diseases. In about 1-2% of cases histopathological examination demonstrate incidental gallbladder cancer (GBCA). We report a case of a 61 year old woman who developed port site metastases after laparoscopic cholecystectomy for adenocarcinoma of the gallbladder. Metastases appeared on all four port sites. Review of literature regarding incidental GBCA an port site metastases was also performed. We conclude that the retrieval bag should be routinely used in laparoscopic cholecystectomy; the procedure should be performed with minimal trauma; in cases of incidental GB carcinoma, full thickness excision of the abdominal wall of the port sites demands additional studies; additional liver bed excision and local lymphadenectomy for T1b carcinoma are yet to be considered.

Key words: incidental gallbladder carcinoma; port-site metastases; laparoscopic cholecystectomy

INTRODUCTION

Laparoscopic cholecystectomy is a surgical procedure of choice for benign gallbladder diseases. In about 1-2% of cases histopathological examination demonstrate incidental gallbladder cancer (GBCA)\(^1\). Dissemination of malignant cells is potential risk in these conditions as it results from aspiration, trauma and spilling the contents of the gallbladder, pneumoperitoneum and during the extraction through a narrow opening in the abdominal wall. The prognosis of the incidental gallbladder carcinoma depends primarily on the stage, histologic grade, surgical margins, lymphatic, vascular and/or perineural spread of the tumor.

CASE REPORT

A 61 year old female patient with abdominal pain and nausea was admitted to the hospital. Abdominal ultrasound demonstrated gallbladder calculi, without apparent thickening of the wall. Serum levels of tumor markers CEA and CA 19-9 were normal. The patient underwent laparoscopic cholecystectomy. The gallbladder was removed via umbilical port without using the retrieval bag, and abdominal drain was placed through right lateral port. Postoperative course was uneventful. The drain was removed on the first postoperative day, and the patient was discharged from the hospital on the second postoperative day. On a regular follow up one month following surgery the patient was without signs and symptoms of postoperative complications.

Histopathology finding of the gallbladder was infiltrative adenocarcinoma of gallbladder (TNM:T3 Nx Mx L1 V1), grade III.

The patient was informed about the necessity for additional surgical procedure, but the patient refused further surgical treatment.

Eleven months after the surgery the patient was readmitted because of a tumor like lump in the area of umbilical port (Figure 1). Laboratory analysis and serum levels of tumor markers CEA, CA 19-9, AFP were in normal range. The patient was operated and surgical procedure included biopsy of the liver bed, excision of metastatic lump and round ligament of the liver (Figure 2) and reconstruction of the anterior abdominal wall defect. Histopathology of the liver bed biopsy was benign. Histopathology of the tumor of the anterior abdominal wall was metastatic adenocarcinoma originating from the gallbladder. (Figure 3)

Eighteen months after LC the patient was readmitted because of the lump in the area of right lateral port, used for abdominal drainage.
The serum levels of the tumor markers were in normal range, and there was no evidence of liver metastasis. The patient was operated and the lump was removed. Histopathology examination confirmed a metastatic adenocarcinoma originating from the gallbladder.

Finally, 24 months after LC the patient was presented with metastasis in the area of epigastric port site. The patient refused further surgical treatment. The patient died 28 months after LC.

**DISCUSSION**

The diagnosis of the gallbladder cancer in the early stages is usually incidental. The disease is presented with typical symptoms of cholelithiasis or cholecystitis. Because of the anatomical characteristics of the region, the disease usually progresses rapidly. The radiological appearance of gallbladder carcinoma include focal or diffuse gallbladder wall thickening, intraluminal polypoid mass, porcelain gallbladder and the tumor projection in the liver bed. Such findings would require an open procedure.

In about 1% of cases, the gallbladder carcinoma is incidental finding during histopathologic analysis following laparoscopic cholecystectomy. The choice for additional surgical intervention in cases of incidental gallbladder carcinoma depends primarily on the tumor stage (Table 1, 2). It is believed that tumor stage <pT1a do not require additional intervention, while patients with tumors >pT1b requires a minimum of liver bed excision and regional lymphadenectomy. Tumors of stage >pT2 requires a resection of segments IV and V of the liver or right hepatectomy with regional lymphadenectomy. In case of the positive resection line on the cystic duct, it is necessary to perform resection of extrahepatic bile duct. Shirai et al. reported a 5 year survival on a sample of 80 patients who underwent no additional interventions: in pT1 - 100%; in pT2 - 40%; and in pT3 - 0%. However, some authors propose radical second wedge resection for T1b carcinoma of the gallbladder. Goetze et al. analyzed 124 patients with T1 cancer with a 5-year survival of 48 % and founded that extended re-resection have increased the 5-year survival up to 68 % for T1 incidental gallbladder carcinoma. Analysis shows a statistically significant survival benefit for re-resection of T1b cancers from 34% to 75%. Further prospective studies are necessary to support this proposition. (Table 1, 2)
There are numerous reports of the incidental gallbladder carcinoma detected after laparoscopic cholecystectomy with postoperative port-site metastasis. Maker et al. in their study which included 113 patients have found that the incidence of port-site metastases after LC for GBCA is up to 40%. However, there is no consensus regarding the patophysiological mechanisms of metastases. Assumptions include trauma and spilling the contents of the gallbladder, the dissemination of malignant cells during the extraction through a narrow opening in the abdominal wall or via the abdominal drain, pneumoperitoneum and CO₂ insufflation. (Table 3)

Since Drouard first described port site metastasis twenty years ago different theories on pathophysiological mechanisms have been proposed. Drouard believed that evacuation of gallbladder through the umbilical port is primary mechanism and many authors followed his opinion. Perforation and spillage during LC increases the incidence of port site metastases from 9% - 40%. Goetze et al. reported a trend toward a lower rate of port-site metastases for patients with perforation of gallbladder who are operated under the protection of retrieval bag compared with those without a bag, and they are proposing routine use of retrieval bag, before perforation has occurred.13 However, in situations where doubt does exist, there is a question of the necessity of converting to open cholecystectomy.

We think that the primary pathological mechanism of metastatic dissemination of malignant cells was direct dissemination during the extraction of the gallbladder as well as spreading of tumor cells along the abdominal drain. However, we cannot with certainty exclude the role of pneumoperitoneum and its impact on the growth of malignant cells. Cirroco and associates reported four patients who underwent laparoscopic operation for primary colon cancer in which there was not only the development of metastases in the port where the resected colon was extracted, but also on all other ports.

In our case the second abdominal wall metastasis presented 6 months after radical excision of the metastatic tumor in the umbilical region of the abdominal wall was positioned laterally, in place of right lateral port; and third metastasis presented 24 months after LC. We can presume that that the second metastasis occurred because of the direct spreading of malignant cells along the abdominal drain, although the interval of 18 months after LC seems too long, but there is no explanation of the third metastasis other then the influence of pneumoperitoneum. It seems that port site metastases are a result of multiple factors which include direct dissemination of malignant cells, pneumoperitoneum, local trauma, histopatologic properties of the tumor, as well as skill of the surgeon. Due to technical limitations, we did not use removal bag during the operation, but we are recommending that it should be routinely used during LC. The open question in the literatu-
re is whether the port-site metastases should be consid-
cred as complication of laparoscopic cholecystectomy. 
Figueiras et al.15 position supports this attitude, but Pa-
olucci in his studies that included 174 patients16 and 149 
patients17 concluded that there was no statistically signi-
ficant difference regarding the incidence of port-site me-
tastases between laparoscopic and open cholecystectomy; 
therefore we think that port-site metastases should not be 
classified as postoperative complication of LC.

The fact that 24 months following LC the patient was 
without signs of local recurrence or liver metastases, with 
port-site metastasis appearing 11, 18 and 24 months follo-
wing surgery, suggests that histopathologic properties of 
the tumor may have a prognostic value. Whether the pre-
cise location of the tumor, T3 carcinoma infiltrating liver 
parenchyma or T3 carcinoma localized on the opposite si-
de, without infiltrating the surrounding structures have 
any prognostic difference remains an open question to be 
answered in future studies.

CONCLUSION

We conclude that the retrieval bag should be routinely 
used in laparoscopic cholecystectomy; the procedure 
should be performed with minimal trauma; in cases of inci-
dental GB carcinoma, full thickness excision of the abdo-
minal wall of the port sites demands additional studies; 
additional liver bed excision and local lymphadenectomy 
for T1b carcinoma are yet to be considered.

SUMMARY

MULTIPLE PORT-SITE METASTASIS INCIDENTAL-
NOG KARCINOMA ŽUČNE KESE NAKON LAPAROSK-
OPSKE HOLECISTEKTOMIJE

Laparoskopska holecistektomija je hirurška procedura 
izbora za benigna oboljenja žučne kese. U oko 1-2% slu-
ćaja incidentno se dijagnostikuje karcinom žučne ke-
se. Prikazujemo slučaj pacijentkinje sa multiple metast-
zasama adenokarcinoma žučne kese na mestima svih porto-
va nakon laparoskopske holecistektomije. Takodje smo 
uradili pregled aktuelnih radova na temu incidentalnog 
karcinoma žučne kese i port-site metastaza. Zaključujemo 
da kese za ekstrakciju žučne kese uvek treba koristiti; pro-
ceduru treba sprovesti sa minimalnom traumom; potrebna 
su dopunska ispitivanja o neophodnosti eksezi jeta 
portova nakon incidentalnog otkrivanja karcinoma žučne 
kese; dodatna eksezi jeta lože žučne kese i lokalna limfa-
dektomija za T1b karcinome žučne kese zahteva dodatna 
istažavanja.

Ključne reči: karcinom žučne kese, port-site 
metastaze; laparoskopska 
holecistektomija

REFERENCES

1. Cucinotta E, Lorenzini C, Melita G, Iapichino G, Cu-
rrro G. Incidental gallbladder carcinoma: does the surgical 
approach influence the outcome? ANZ J Surg. 2005;75: 
795-798.
5. Goetze TO, Paolucci V. Immediate radical resection of T1 incidental gallbladder cancer and the problem of an adequate extent of resection (results of the German registry "Incidental Gallbladder Cancer"). Zentralbl Chir. 2011; Mar 1 (Epub ahead of print).