

# Challenges in Managing Delayed Port-Site Metastasis of Gallbladder Adenocarcinoma: A Case Report and Literature Review

## Abstract

Port-site metastasis following laparoscopic cholecystectomy for gallbladder adenocarcinoma, though rare, represents a critical oncological issue. The development of such metastasis is concerning due to the potential for delayed diagnosis and its implications for patient prognosis. We present the case of a 42-year-old female who developed a cutaneous metastasis at the epigastric port site six years after undergoing laparoscopic cholecystectomy for gallbladder adenocarcinoma. The metastasis manifested as an ulcero-proliferative mass with squamous differentiation. A biopsy confirmed poorly differentiated carcinoma. Despite the significant surgical history, the patient did not return for cancer evaluation or adjuvant therapy post-surgery, leading to this late complication. The occurrence of port-site metastasis underscores the diagnostic challenges and the critical need for vigilant long-term follow-up in patients with gallbladder carcinoma. This case highlights the importance of considering primary cutaneous malignancies in differential diagnoses and discusses the surgical complexities involved in managing such metastasis. The proximity of the mass to the subcostal margin and the risk of infection precluded the use of mesh during the excision, complicating the surgical approach. This also increased the patient's risk of incisional hernia, which would require further surgical intervention. This case illustrates the importance of long-term follow-up after laparoscopic cholecystectomy for gallbladder adenocarcinoma. Surgical challenges, including the difficulty of adequate margin in the epigastric region, risk of recurrence at port sites, and the potential need for further interventions for incisional hernia, must be considered to optimize patient outcomes.

**Keywords:** *Port-site metastasis, Gallbladder adenocarcinoma, Laparoscopic cholecystectomy, Cutaneous metastasis*

## Introduction

Cutaneous metastasis from internal malignancies is rare, with an incidence ranging from 1.0% to 4.6%.<sup>[1]</sup> These metastases can present as Sister Mary Joseph nodules (SJNs) or non-SJNs, the latter including metastasis post-surgery, injury, or lymphadenopathy. Non-SJN metastasis after laparoscopic surgery for malignancies occurs in just 1-2% of cases.<sup>[2]</sup>

Surgery remains the primary treatment for resectable gallbladder carcinoma. Port-site recurrence following laparoscopic surgery is a concern, often attributed to factors such as bile leakage or gallbladder perforation during the procedure, which may increase tumor recurrence risk and reduce survival.<sup>[3]</sup>

Cutaneous metastasis from gallbladder carcinoma is particularly rare, with reported incidences between 0.7% and 9%.<sup>[3]</sup> These

metastases often signify advanced disease and pose significant surgical challenges, including the management of infected ulcerative lesions and the prevention of complications such as incisional hernias. This case emphasizes the necessity of thorough post-surgical follow-up, including staging, assessment for metastasis, and consideration of adjuvant therapies. Here, we present a case of port-site cutaneous metastasis following laparoscopic cholecystectomy for gallbladder adenocarcinoma.

## Case report History and examination

A 42-year-old woman presented with a progressively enlarging ulcero-proliferative mass at the epigastric port site, characterized by ulcerative changes and serosanguinous discharge over four months. She had undergone laparoscopic cholecystectomy in 2018 for what was

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Website: [www.cijj-online.org](http://www.cijj-online.org)

DOI: [10.51847/kfnpFFkVsN](https://doi.org/10.51847/kfnpFFkVsN)

### Quick Response Code:



**How to cite this article:** Mohan A, Kushwaha A, Singh A, Singh D, Rathore YS, Ranjan P, *et al.* Challenges in Managing Delayed Port-Site Metastasis of Gallbladder Adenocarcinoma: A Case Report and Literature Review. Clin Cancer Investig J. 2024;13(6):1-4. <https://doi.org/10.51847/kfnpFFkVsN>

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initially diagnosed as gallstone disease, later identified as moderately differentiated gallbladder adenocarcinoma [pT2NxMx]. The patient did not return for further cancer evaluation or treatment post-surgery. On examination, a 5x4 cm ulcero-proliferative mass was noted at the epigastric port site, with desquamation and serosanguinous discharge. A biopsy confirmed poorly differentiated carcinoma with desmoplastic stroma; immunohistochemistry was positive for CK-7 and CK-20 and negative for GATA-3 and TTF1.

### Imaging

Preoperative contrast-enhanced computed tomography (CECT) revealed a 5.6x6.1 cm heterogeneous mass extending into the peritoneum, without lymphadenopathy. PET-CT showed a 4.7x4.4x3.7 cm mass in the mid-anterior abdominal wall, involving skin and subcutaneous tissue, with no evidence of distant metastases.

### Operative procedure

The patient underwent a wide local excision (WLE) of the epigastric mass, measuring 6x6 cm, with a 1 cm margin that included the underlying peritoneum. The procedure was completed without intra- or postoperative complications.

### Postoperative course

The patient recovered uneventfully and was discharged on postoperative day 5 with instructions for diabetes management and regular follow-up.

### Histopathology

The excised specimen measured 8x7x7 cm, with a 5x4.5x3 cm ulcero-proliferative growth. Microscopic examination revealed adenosquamous carcinoma with focal immunopositivity for p40 and negative Her-2-neu. Lymphovascular invasion was present, but perineural invasion was absent. The tumor ulcerated the overlying skin, but the deep resected margin was tumor-free.

### Results and Discussion

Cutaneous metastasis from visceral malignancies is rare and often indicates advanced, aggressive disease. Gallbladder carcinoma typically spreads locoregionally to the liver, lymph nodes, adjacent organs, and peritoneum, with cutaneous metastasis being extremely uncommon.<sup>[4]</sup> The diagnosis was confirmed through histopathology and immunohistochemistry, highlighting the importance of thorough post-surgical follow-up after laparoscopic cholecystectomy for gallbladder carcinoma. Gallbladder malignancies are the sixth most common gastrointestinal cancers, with adenocarcinoma being the predominant histological type.

Port-site metastasis in gallbladder adenocarcinoma has been documented in multiple cases,<sup>[5,6]</sup> often following unexpected preoperative gallbladder carcinoma diagnosis. The interval between laparoscopic cholecystectomy and port-site metastasis can extend up to four years.<sup>[7]</sup> Tumor cells may disseminate through various routes, including direct

implantation, hematogenous or lymphatic spread, and extranodal extension from lymph node capsules into surrounding subcutaneous tissue. Direct implantation or seeding of exfoliated tumor cells during surgery is the most plausible mechanism for cutaneous metastasis at surgical incisions and laparoscopic port sites. Inflammatory responses during wound healing, involving macrophages and angiogenic factors, may facilitate tumor growth. Port-site metastasis may result from wound contamination, pneumoperitoneum, aerosolization of tumor cells, and host factors such as age, immunosuppression, obesity, and advanced cancer stage.<sup>[2]</sup>

Like inflammatory skin lesions, metastatic cutaneous lesions are typically non-tender, erythematous, or nodular, and they frequently affect the skin of the thorax, abdomen, limbs, neck, head, and scalp.<sup>[8]</sup> Akhtar *et al.* and Padilla *et al.* have documented similar cases of ulcero-proliferative cutaneous metastases at the port site after cholecystectomy for gallbladder cancer.<sup>[9]</sup>

Detection of incidental gallbladder malignancy during routine cholecystectomy underscores the critical importance of careful patient follow-up.<sup>[7]</sup> This follow-up should include comprehensive staging, assessment for metastasis, evaluation for residual disease, and consideration of adjuvant chemotherapy or radiotherapy as necessary. Histopathological examination of all gallbladder specimens removed during routine laparoscopic cholecystectomies for gallstone disease is essential.<sup>[10]</sup>

In this case, the patient did not return for follow-up after the initial surgery, leading to missed opportunities for metastasis evaluation and postoperative adjuvant therapy for incidentally detected carcinoma. The patient later presented with a neglected, ulcerated growth in the epigastrium. The exophytic mass was ulcerated, with infected ulcers on its surface that bled upon examination. The patient's diabetic status likely contributed to the superimposed infection.

Surgery posed significant challenges due to the mass's proximity to the subcostal margin. If excision had left a raw area, collaboration with a plastic surgery team might have been required to cover it with a flap.<sup>[11]</sup> Additionally, infection on the lump's surface precluded using a mesh to prevent a future epigastric hernia, as this could lead to complications such as meshoma or mesh infection, necessitating mesh removal.

The patient now faces a high risk of developing an incisional epigastric hernia. If this occurs, a second surgery will be necessary to repair the hernia with a mesh. While the incidence of epigastric hernias is relatively low compared to other ventral wall hernias—due to the support provided by the costal margin and the underlying liver and spleen—the potential for complications remains.<sup>[12]</sup>

In this instance, histology and clinic-radiological correlation were used to corroborate the diagnosis. Immunohistochemistry plays a critical role in the differential diagnosis because certain metastatic tumours can resemble

basic skin cancers. To detect squamous differentiation in the tumour, we used p63.

Techniques such as preoperative irrigation of the port site with a cytotoxic solution, meticulous handling of the resected tumor specimen, use of retractor bags during surgery, and closure of the peritoneum at all port sites may help prevent metastasis to some extent.<sup>[10, 11]</sup> Cutaneous metastases from gallbladder malignancies signify advanced disease and are associated with poor prognosis, making early diagnosis essential.

### Summary

Port-site metastasis after laparoscopic cholecystectomy for gallbladder adenocarcinoma, though rare, represents a significant oncological concern. In this case, a 42-year-old female developed a cutaneous metastasis at the epigastric port site six years post-surgery, presenting as an ulceroproliferative mass. Despite her surgical history, the patient did not return for cancer evaluation or adjuvant therapy after her initial procedure, leading to delayed diagnosis and treatment. The metastatic lesion was confirmed as poorly differentiated carcinoma with squamous differentiation. The case highlights the challenges of diagnosing port-site metastasis and underscores the necessity for long-term follow-up in patients with gallbladder carcinoma. Surgical management was complicated by the lesion's proximity to the subcostal margin and the presence of infection, which precluded the use of mesh during excision, thereby increasing the risk of incisional hernia.

### Conclusion

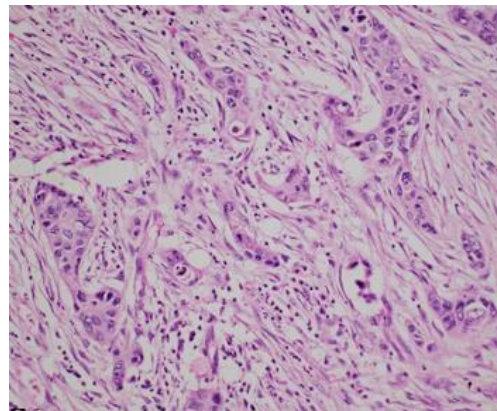
This case underscores the critical need for vigilant, long-term follow-up after laparoscopic cholecystectomy for gallbladder adenocarcinoma to promptly identify and manage potential port-site metastases. The surgical challenges encountered, including ensuring adequate margins, preventing infection, and managing the risk of incisional hernia, highlight the need for a multidisciplinary approach to optimize patient outcomes. Early detection and intervention are key to improving prognosis in patients with metastatic gallbladder carcinoma. In addition the importance of routine histopathological examination of all the resected gall bladder specimens for detecting incidental gall bladder carcinoma and adequate management is also emphasized.



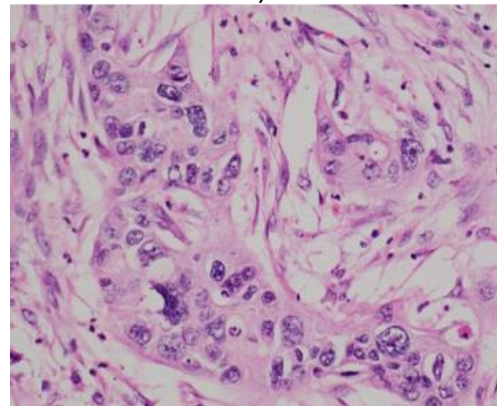
Figure 1. Preoperative image of epigastric port metastasis.



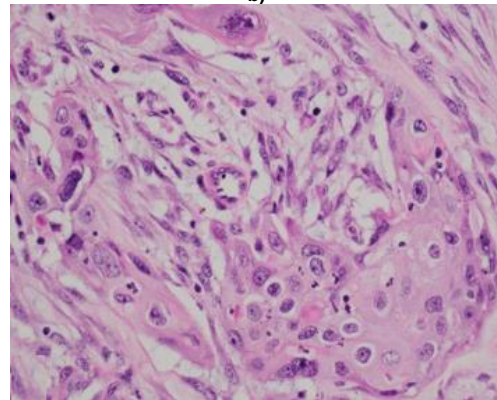
Figure 2. Excised port site metastasis specimen.



a)



b)



c)

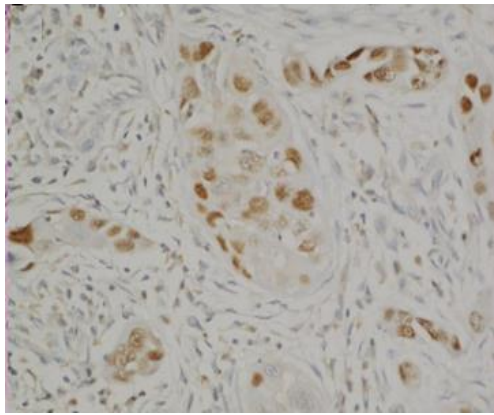


Figure 3. a) Sections examined show an infiltrative tumor with both glandular and squamoid areas; H&E X200. Glandular (b) and squamoid (c) areas are highlighted; H&E X400. The squamoid areas are immunopositive for P40 (d); X400.

### Acknowledgments

None

### Conflict of interest

None

### Financial support

None

### Ethics statement

Informed consent was obtained from the participant included in the study and the participant has consented to the submission of the case report to the journal.

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