Radiologic features of locally advanced gallbladder carcinoma

RICHARD LI, HARVARD MEDICAL SCHOOL YEAR 3
GILLIAN LIEBERMAN, MD
Outline

1. Our patient – presentation and history
2. Background – Normal anatomy
3. Our patient – Initial ultrasound
4. Background – epidemiology and risk factors
5. Radiologic appearances of gallbladder cancer on CT
6. Differential diagnosis
7. Our patient – outcome
Our patient – Presentation

82 M

CC: RUQ pain for 1 month

HPI:
Our patient – Presentation

**PMH:** HTN, BPH, aortic regurgitation, psoriasis

**PE:** Vitals 99.5, HR 104, BP 149/60, O₂ 99%

- Normal except for RUQ tenderness

**Lab values:**
- ALT/AST normal, ALP 129, T Bilirubin 1.4
- CEA: 8.2 AFP: 2.5
Radiologic evaluation

ACR Appropriateness Criteria

<table>
<thead>
<tr>
<th>Chief Complaint</th>
<th>Imaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>RUQ Pain</td>
<td>Ultrasound</td>
</tr>
<tr>
<td>Painful jaundice</td>
<td>Ultrasound</td>
</tr>
<tr>
<td>Painless jaundice</td>
<td>Ultrasound + MDCT</td>
</tr>
<tr>
<td>Non-obstructive jaundice</td>
<td>Ultrasound + MRI</td>
</tr>
</tbody>
</table>
Background – Gallbladder anatomy

Healthhype.com
Background – Normal gallbladder on CT

CT axial view
Radiologyinfo.org
Background – Normal gallbladder on ultrasound

Gallbladder ultrasound, transverse view

Emergencyultrasoundteaching.com
Our patient – ultrasound

Heterogeneous, poorly circumscribed mass seen in gallbladder fossa

No remnant of normal gallbladder seen

Gallbladder ultrasound, transverse

*Courtesy of Quang Nguyen, MD. BIDMC, PACS*
Background - epidemiology

- Clinically: RUQ pain, weight loss, jaundice
- **Presents late**, 90% of symptomatic patients have advanced disease
- Most common biliary tract cancer: 6,500 deaths per year
- 90% adenocarcinoma, 10% squamous
- 5% overall survival at 5 years
Background – Risk factors

- Porcelain gallbladder
- Female gender
- Obesity
- Increasing age
What is the next step?

CT to further characterize lesion

Let’s talk about the typical radiologic appearances of gallbladder carcinoma on CT
Appearances of gallbladder carcinoma

1. mass replacing gallbladder lumen (55%)
2. polypoid lesion (25%)
3. irregular wall thickening (20%)
Our patient – Mass on CT Scan

Heterogeneous, poorly circumscribed mass with no remnant of normal gallbladder seen, hepatic involvement

Renal cysts also observed

C+ CT Axial View, portal venous phase

*Courtesy of Quang Nguyen, MD. PACS, BIDMC*
Our patient – Mass on CT Scan

Heterogeneous, poorly circumscribed mass extending beyond inferior border of normal gallbladder

C+ CT axial view, portal venous phase

Courtesy of Quang Nguyen. PACS, BIDMC
Our patient – Mass on CT scan

Heterogeneous, poorly circumscribed mass extending beyond inferior border of normal gallbladder

C+ CT coronal view, portal venous phase

*Courtesy of Quang Nguyen, MD. PACS, BIDMC*
Now we will examine the other two common radiologic appearances of gallbladder carcinoma on CT.
Companion patient 1 – polypoid appearance on CT

Polypoid intraluminal lesion observed on CT scan

C+ CT axial view, portal venous phase

Brooke RJ. StatDX
Companion patient 2 – Wall thickening appearance on CT

Diffuse, heterogeneous mural thickening can also be a radiologic appearance of gallbladder carcinoma, especially when accompanied by hepatic involvement.

C+ CT axial view
van Breda Vriesman et al. radiologyassistant.nl
Differential

Adenomyomatosis

Primary malignancies with gallbladder invasion

Metastatic disease to the gallbladder

Benign lesions

Xanthogranulomatous Cholecystitis (XGC)

Gallbladder sludge
Now we will take a look at some common benign conditions that can be potentially confused for gallbladder carcinoma...
Companion patient 3 – Tumefactive sludge on ultrasound

Gallbladder ultrasound

Note the shifting of the mass to a dependent position
Diffuse gallbladder wall thickening with marked irregularity, can sometimes be indistinguishable from GB carcinoma.

C+ CT axial view

van Breda Vriesman et al. radiologyassistant.nl
Staging

• Chest CT and abdomen/pelvis CT for distant metastases

• Pathologic staging after surgery or biopsy
Common sites of involvement

• Direct invasion of liver, duodenum, bile duct
• Lymphatic spread to porta hepatis
• Intraperitoneal spread to other abdominal organs
• Hematogenous spread to lungs, bones
Our patient – outcome

• Pathology showed adenocarcinoma

• No LN or distant metastatic involvement, T3N0 disease

• Treated with extended cholecystectomy with possible adjuvant chemotherapy and radiation
Conclusions

• Gallbladder carcinoma usually presents late with RUQ pain, weight loss, and/or jaundice

• Most patients have advanced disease and prognosis is poor

• Three common radiologic appearances: mass replacing lumen, polypoid lesion, diffuse wall thickening

• Differential on imaging includes adenomyomatosi, XGC, sludge, metastases, other primaries
Acknowledgments

Quang Nguyen, my big sib, for his feedback and advice
Megan Garber, for her unending helpfulness
Dr. Lieberman, for a wonderful clerkship
My classmates, for a great month together
References


Chun KA et al. Xanthogranulomatous cholecystitis: CT features with emphasis on differentiation from gallbladder carcinoma. Radiology 203(1), 1997
Image references

Brooke RJ. StatDX. Gallbladder carcinoma. [https://my.statdx.com]


Hayden G. Emergency ultrasound teaching. [www.emergencyultrasoundsite.com]

