

Case Number 7

Liver Abscess following ingestion of a foreign object

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Case summary:

Demographic details:

Ms. MB, female.

Referred from: home

A 31 year old, previously healthy female presented to A&E on 24/07/2012 with a 2 day history of colicky epigastric pain and spiking fever; however on investigation no pathology was found except for an ovarian cyst of 4cm. It was concluded that it was unlikely that the cyst was causing pain and fever and the patient was discharged. She was given proton pump inhibitors for 2 weeks and pain improved, however on stopping therapy, the pain became much more severe, with radiation to the back. She presented to A&E again on 05/08/2012. A more detailed history elicited the fact that she had ingested half a toothpick by mistake 3 weeks previously. Imaging showed the formation of an abscess between the stomach and liver; which needed drainage.

Presenting complaint:

Epigastric pain: 3 weeks

Low grade fever: 3 days

History of presenting complaint:

The epigastric pain started gradually on 22/07/12 and was colicky in nature with no radiation.

The patient was nauseated but did not vomit and pain killers had no effect. The pain was unrelated to food intake, position and breathing and was described as quite severe (6/10). The patient had also been febrile for 3 days. Omeprazole therapy was initiated on 24/07/12, and the pain improved somewhat but persisted. On stopping omeprazole on 01/08/12, the pain worsened to 8/10. The patient presented again to A&E on 05/08/12 complaining of epigastric pain with radiation to the right hypochondrium and back. The pain was colicky in nature and also persisted through the night preventing sleep and associated with severe belching. By this time the patient had become anorexic with chills, rigors and a spiking fever.

Past medical and surgical history:

Past medical history:

Previously healthy. Nil of note.

Past surgical history:

Ovarian cyst (Last seen on CT abdo/pelvis on 24/07/12, unchanged from previous CT scans)

Laparoscopy for ovarian freezing

Liposuction

Tummy tuck

No reported adverse reactions to anaesthesia.

Drug history:

Drug	Dosage	Frequency	Type	Reason
Paracetamol	1g	PRN	Analgesic	Relief for epigastric pain
Omeprazole	20mg	BD	PPI	Relief of acid reflux

Family history:

No family history of specific illnesses

Social history:

MB lived with her husband and children. She reported smoking approximately 20 cigarettes daily and drank only socially. There was no history of binge drinking or drug abuse.

Systemic inquiry:

First Hospital Event 24/7/12

- General Health: she looked well in general but with the anorexia there was evidence of weight loss over the past 3 weeks. Lethargy, rashes, sleep disturbances
- Cardiovascular System: chest pain, palpitations, SOB, Orthopnea, PND, syncope
- Respiratory System: cough, wheeze, sputum
- Genitourinary System: dysuria, haematuria
- Central Nervous System: headaches, seizures, blurring of vision/visual problems, tinnitus
- Musculoskeletal System: muscle aches, claudication
- Endocrine System: hot/cold intolerance, excessive sweating, tremor

Discussion of results of general and specific examinations:

Physical Examination: On presentation her pulse was regular at a rate of 85 beats per minute. The Blood Pressure was 130/70 but she was pyrexial at 100.3°F with her SpO2 98% on air. She was alert, oriented and not jaundice.

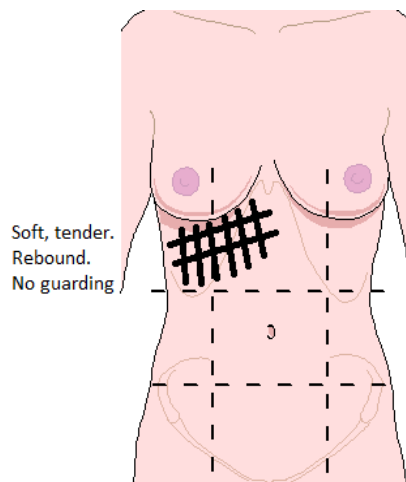


Diagram 1

Examinations of the cardiovascular and respiratory systems were unremarkable, with the main findings being in the abdomen. Her abdomen was soft but with tenderness in the epigastrium and right hypochondrium with rebound tenderness but no guarding or rigidity (Diagram 1). The rest of the abdominal examination including hernial orifices and rectum were normal.

In view of the history of ovarian cyst she underwent a full gynaecological assessment but this was within normal limits.

Differential diagnosis:

- Peptic Ulcer Disease particularly perforated duodenal ulcer
- Acute Cholecystitis
- Pancreatitis
- Appendicitis
- Musculoskeletal pain
- Liver abscess
- Ovarian cyst

Diagnostic procedures:

Laboratory Investigations:

Test: Urinalysis 24/07/12:

Results: Protein: Trace

Blood: +++

Test: Urine Microscopy 24/07/12:

Results: Erythrocytes: 150 U/L

Nitrites: Negative

White blood cells: Negative

Test: Blood tests 24/07/12:

Justification for test: To take baseline values and make a diagnosis according to the clinical findings

Results: CBC: Normal

Coagulation screen: Normal

Renal profile: Normal

Amylase: Normal

Calcium and phosphate: Normal

Imaging Investigations:

Test: Abdominal X-Ray 24/07/12

Justification for test: Basic investigation and to identify possible pathology:

Result/Conclusion: No abnormality detected

Test: Chest X-Ray 24/07/12:

Justification for test: Basic investigation and to identify possible pathology

Result/Conclusion: No abnormality detected

Test: Ultrasound abdomen 24/07/12

Justification for test: To diagnose or rule out abdominal pathologies

Result: Avascular area adjacent to liver; may represent a distended gastric antrum. Mildly distended gallbladder (common bile duct not seen).

Test: CT abdomen & pelvis 24/07/12:

Justification for test: To identify abdominal or pelvic abnormalities.

Result: No pulmonary lesion is seen in the lung bases. No free gas, abscess or signs of bowel obstruction are seen. The pancreas, liver, gall bladder, spleen, both adrenals, kidneys and urinary bladder are normal. The abdominal and retroperitoneal lymph nodes are not enlarged. No ascites is present. There is a 4cm cystic formation in left ovary.

Conclusion: All findings normal except 4cm cystic lesion in the left ovary.

Second Hospital Event 5/8/12

Test: Ultrasound Abdomen & Pelvis: Day 1:

Justification for test: Reassessment of patient on her second admission.

Result: Difficult examination due to patient habitus and abundant bowel gas in the upper abdomen. The liver is normal in size and echotexture. An ill-defined hypoechoic avascular area is seen adjacent to the liver in the vicinity of the stomach. No intra- or extrahepatic bile duct dilatation is seen. Normal flow is seen in the portal vein. The gall bladder is mildly distended (4.5cm width) but no stones or signs of inflammation are seen. The common bile duct could not be visualized due to abundant bowel gas. Both kidneys are normal in size, shape and parenchymal thickness. No stones or hydronephrosis are seen. The right kidney measures 12.5cm and the left kidney measures 12.1cm (interpolar dimensions). The urinary bladder is unremarkable. The spleen has a normal echotexture and size. No free fluid is seen in the abdomen and pelvis.

Conclusion: An ill-defined hypoechoic avascular area is seen adjacent to the liver in the vicinity of the stomach. This may represent a distended gastric antrum. Mildly distended gall bladder.

Therapy:

Drugs:

Drug	Dosage	Frequency	Type	Reason
Hartmann's solution	1L	8 hourly	Rehydration IV solution	To ensure good hydration
Cefuroxime	750mg	TDS	IV antibiotics	To clear possible infective agent
Ranitidine	50mg	TDS	Histamine receptor antagonist	Inhibits acid production in the stomach
Maalox	20ml	TDS	Antacid	Neutralises acid in stomach
Clexane	40mg	DLY	Anticoagulant	Thromboprophylaxis in a high risk patient (smoker, relatively immobile)

Management:

Day 2: The patient improved with analgesia but still had chills and rigors even though she was tolerating a light diet.

Physical Examination: Pulse 80 bpm
BP: 125/70
Temperature: 99.3°F
SpO2 on air: 99%

She was haemodynamically stable, alert, oriented and not jaundiced.

Abdomen: Tenderness epigastrium and right hypochondrium, with soft abdomen and no guarding.

Day 3: CT Abdomen & Pelvis: The lung bases are clear. The spleen, pancreas, adrenals and kidneys are normal. There is a large ill-defined hypodense lesion in the left liver lobe measuring about 56 x 42mm. No enlarged nodes, free air, or free fluid are seen. The uterus and uterine bladder are normal. There is complex left ovarian mass measuring 36mm due to probably dermoid. Impression: Liver abscess that requires drainage.

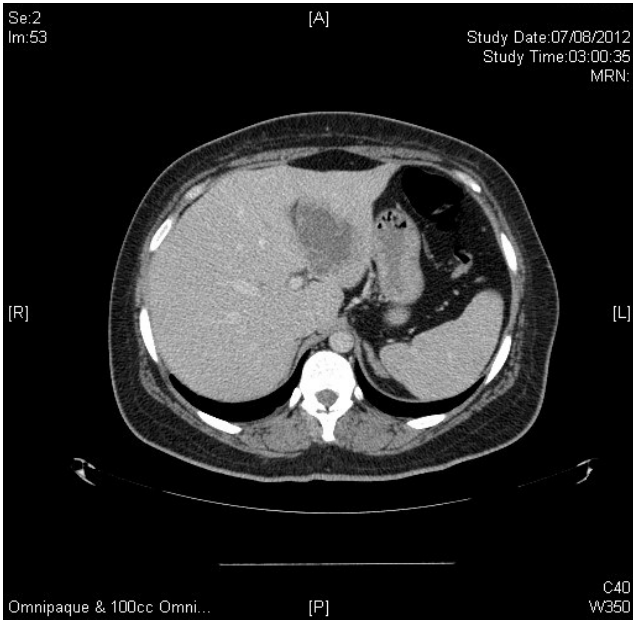


Image 1: Abscess visible within left lobe of liver

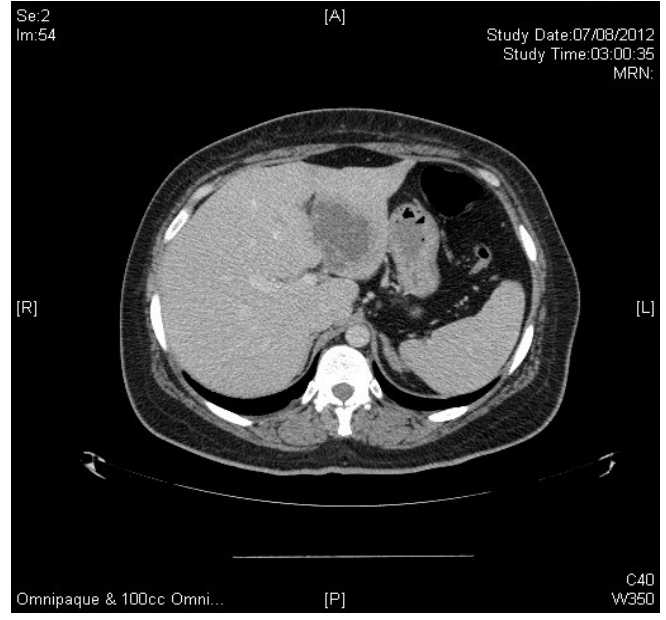


Image 2: Abscess visible within left lobe of liver

Operation: Day 3:
CT guided cyst drainage

Procedure:

- Drainage and insertion of pigtail catheter into liver abscess under CT control
- 10F catheter inserted
- 30ml of pus aspirated

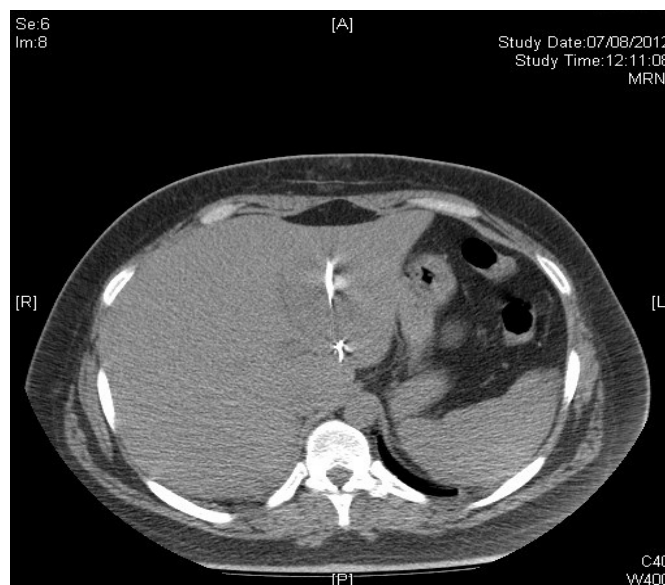


Image 3: Drainage under CT control

Patient stable post-procedure. Analgesia PRN.

Gentamycin given, calculated according to patients weight (355mg 8 hourly).

Day 4: Following this procedure the patient became afebrile for the first time. She remained well with no further complications until discharge. As at this stage the diagnosis was still obscure so a further CT scan was scheduled for day 7 to try to identify the cause of the perforation that led to the subhepatic and hepatic abscess. The investigation however confirmed the presence of a resolving abscess with a drain within but no other foreign bodies were visible. A follow-up CT scan, taken 19 days post-procedure showed that the abscess was healing well. The image is shown below (Image 4).

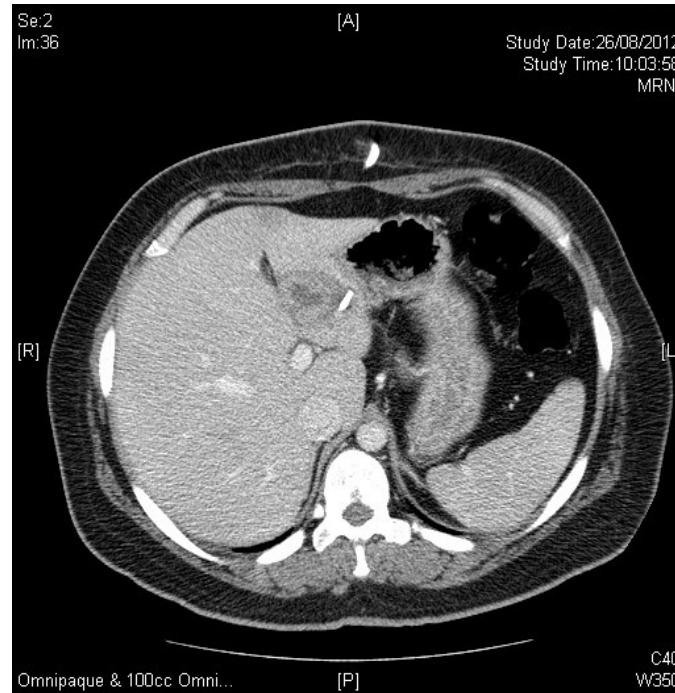


Image 4: Healing abscess with drain within

In view of the fact that the patient had been previously perfectly healthy and the history of inadvertent ingestion of half a toothpick 3 weeks previously there was little doubt that the sequence of events was of perforation of the lesser curvature of the stomach with the ingested toothpick and subsequent subhepatic and intrahepatic abscess formation.

Diagnosis:

This is a case of liver abscess following accidental ingestion of a foreign body, namely half a toothpick. Unintentional ingestion of foreign bodies is common in daily life. Ingested foreign bodies pass through the gastro-intestinal system undiscovered within a week in approximately 80-90% of cases¹⁻³. In the remainder of cases, obstruction is the likeliest cause of symptoms¹⁻².

Perforation is a rare finding in 1% of cases. The areas which are commonly affected are the ileocecal region, the rectosigmoid region and the duodenum²⁻⁵. Development of a hepatic abscess is even rarer. Between the first reported case in 1898 and 2007 only 47 cases were reported globally⁶. The commonest sites of perforation of the gut are the stomach and duodenum⁵.

Establishing the diagnosis is difficult as the patients may be unaware of their ingestion and presentation is often late as the migrating foreign body can remain silent until an abscess has formed^{1,3,4}. Symptoms are usually non specific, with abdominal pain, fever, nausea and vomiting, anorexia and weight loss. Furthermore, the classical presentation of hepatic abscess (i.e. fever, abdominal pain and jaundice) is

only present in a few cases⁵⁻⁷. In 1955, Griffiths described a case of septic shock and subsequent death following the ingestion of a needle. So far, only two cases of death were reported, both by Griffiths⁸. Laboratory findings are also non specific and identification on plain radiography is not possible unless the foreign body is radio-opaque^{3,4}. CT scan is preferred technique for the diagnosis due to its high resolution and accuracy. The second best option is an abdominal ultrasound¹. In the vast majority of such cases treatment includes drainage and antibiotic therapy and does not require more extensive surgical procedures³.

A literature review by Santos et al found that fish bones were the most common foreign body and the stomach was the principal site of perforation¹¹. Abscess formation occurs more commonly on the left lobe. Isolated microorganisms on abscess or fluid cultures are usually part of the normal flora of human oropharynx. Prognosis depends on a rapid diagnosis^{6, 9-11}.

From a total of 47 reported cases of abscess formation secondary to ingestion of a foreign object, 12 cases (25.5%) were due to toothpick ingestion. Of these 12 cases there was only one mortality. 58% of these cases reported a perforation through the stomach, 33% reported a perforation through the duodenum whilst in 9% the perforation was through the colon. The left lobe was the most commonly affected lobe (66%). Presenting complaints included epigastralgia, fever, vomiting and shock. Management involved removal of the toothpick with abscess drainage in all cases except one. This patient refused surgery and was consequently treated with antibiotics¹¹.

Final treatment and follow ups:

Following CT drainage of the abscess, the patient made a rapid and unremarkable recovery with the post-procedure CT confirming resolution of the abscess. The patient was discharged on day 8 post-admission with lifestyle advice regarding smoking cessation, reduction of coffee intake and to eat small frequent fat free meals and to pay more attention while eating.

Fact Box 7:

Title: Liver Abscess

Short description of condition:

A liver abscess is a pus-filled cavity within the liver which is normally caused by a biliary tract source but can also be due to other intra-abdominal processes, including diverticulitis, and hematogenous spread. In this case hepatic abscess occurred following perforation of the gastrointestinal tract caused by ingested foreign body.

Risk factors: Inflammatory bowel disease, especially Crohn's disease, due to loss of integrity of the mucosal barrier

- Liver cirrhosis
- Hepatic transplant
- Hepatic artery embolization
- Institutionalization
- Immunocompromise / Immunodeficiency syndromes
- Older age (particularly associated with biliary sepsis)
- Malnutrition, malignancy, pregnancy, steroid use, and excessive alcohol intake

Symptoms:

- Chills and rigors
- Right upper quadrant pain
- Anorexia
- Malaise
- Referred pain to the right shoulder is also possible
- Irritation of the diaphragm may also cause cough or hiccoughs however this is unlikely

Signs:

- Fever (either continuous or spiking)
- Right upper quadrant tenderness
- Hepatomegaly
- A mass may be palpable
- One fourth of cases may present with jaundice and this is usually associated with biliary tract disease or the presence of multiple abscesses
- A pleural or hepatic friction rub are uncommon but may be associated with diaphragmatic irritation or inflammation of Glisson capsule

Prevention:

- Prompt treatment of biliary, gastrointestinal, pelvic, and systemic infections that may spread to the liver
- Minimize alcohol intake to maintain hepatic cellular integrity

Prognosis: Liver abscess is almost uniformly fatal if left untreated. Timely treatment, which includes drainage and antibiotics reduces mortality to approximately 5%.

References:

Case Report:

1. Kanazawa S, Ishigaki K, Miyake T et al. A granulomatous liver abscess which developed after a toothpick penetrated the gastrointestinal tract: report of a case. *Surg Today* 2003; 33: 312-314
2. Cheung YC, Ng SH, Tan CF et al. Hepatic inflammatory mass secondary to toothpick perforation of the stomach: triphasic CT appearances. *Clin Imaging* 2000; 24: 93-95
3. Horii K, Yamazaki O, Matsuyama M et al. Successful treatment of a hepatic abscess that formed secondary to fish bone penetration by percutaneous transhepatic removal of the foreign body: report of a case. *Surg Today* 1999; 29: 922-926
4. Broome CJ and Peck RJ. Hepatic abscess complicating foreign body perforation of the gastric antrum: an ultrasound diagnosis. *Clin Radiol* 2000; 55: 242-243
5. Chintamani, Singhal V, Lubhana P et al. Liver abscess secondary to a broken needle migration--a case report. *BMC Surg* 2003; 3: 8
6. De la Vega M, Rivero JC, Ruiz L et al. A fish bone in the liver. *Lancet* 2001; 358: 982
7. Tsui BC, Mossey J. Occult liver abscess following clinically unsuspected ingestion of foreign bodies. *Can J Gastroenterol* 1997; 11: 445-448
8. Griffiths FE. Liver abscess due to foreign-body migration from the alimentary tract; a report of two cases. *Br J Surg* 1955; 42: 667-668
9. Tomimori K, Nakasone H, Hokama A et al. Liver abscess. *Gastrointest Endosc* 2004; 59: 397-398
10. Kessler AT, Kourtis AP. Images in clinical medicine. Liver abscess due to *Eikenella corrodens* from a fishbone. *N Engl J Med* 2001; 345
10. Paraskeva KD, Bury RW and Isaacs P. *Streptococcus milleri* liver abscesses: an unusual complication after colonoscopic removal of an impacted fish bone. *Gastrointest Endosc* 2000; 51: 357-358.
11. Santos SA, Alberto SCF, Cruz E et al. Hepatic abscess induced by foreign body: Case report and literature review. *World J Gastroenterol* 2007; 13: 1466-1470

Fact Box:

1. Cameron JL. Hepatic abscess. In: *Current Surgical Treatment*. 8th ed. (2004): 298-303.
2. Reid-Lombardo KM, Khan S, Scwabas G . *Liver Surgery: From Basics to Robotics Hepatic Cysts and Liver Abscess*. *Surgical Clinics of North America*, 2010, Volume 90, Issue 4, Pages 679-697
3. Feldman M, Friedman LS, Brandt LJ. *Gastrointestinal and Liver Disease: Pathophysiology/Diagnosis/Management*, Ninth Edition. Chapter 82 , 1351-1369
4. Peralta R. Liver Abscess. <http://emedicine.medscape.com/article/188802-overview>. Last Updated: Nov 30, 2011. Accessed on 02/01/2013