



RADIOLOGICAL CASE SERIES: IMAGING SPECTRUM OF ACUTE ABDOMINAL PATHOLOGIES ON CT

Radio-Diagnosis

Dr. K. G. Easwar	Junior Resident, Department Of Radiology, Sri Lakshmi Narayana Institute Of Medical Sciences.
Dr. Sai Tarani	Assistant Professor, Department Of Radiology, Sri Lakshmi Narayana Institute Of Medical Sciences.
Dr. Raguraman	Assistant Professor, Department Of Radiology, Sri Lakshmi Narayana Institute Of Medical Sciences.
Dr. Nitishkumar Yeslawath	Professor, Department Of Radiology, Sri Lakshmi Narayana Institute Of Medical Sciences.

ABSTRACT

Acute abdominal conditions represent a wide spectrum of surgical and medical emergencies where timely radiological evaluation is critical for patient outcomes. Computed Tomography (CT) has emerged as the cornerstone imaging modality due to its ability to rapidly detect pathology, delineate disease extent, and guide therapeutic decisions. This case series highlights distinct abdominal pathologies encountered in emergency settings: acute pancreatitis with extensive ascites, chronic pancreatitis complicated by gastric perforation, emphysematous pyelonephritis, ectopic kidney with pyelonephritis, chronic cystitis, mesenteric ischemia post LSCS, appendicular abscess, hepatic abscess and hepatic metastases. Each case is an unusual presentation and emphasizes the role of CT in diagnosis and management. The findings underscore CT's diagnostic accuracy and its pivotal role in differentiating pathologies that present with overlapping clinical symptoms.

KEYWORDS

Acute abdomen, Computed Tomography, Emphysematous pyelonephritis, Mesenteric ischemia, Hepatic abscess.

INTRODUCTION

The acute abdomen encompasses a broad range of conditions that can be life-threatening without rapid diagnosis and appropriate management. Clinical presentation is often nonspecific, making imaging indispensable for diagnosis. Computed Tomography (CT) has become the imaging modality of choice in emergency abdominal evaluation due to its rapid availability, high spatial resolution, and ability to assess multiple organs simultaneously. This case series presents eight representative cases of acute abdominal pathology, emphasizing CT findings and their implications for management.

Case 1: Acute Pancreatitis With Extensive Ascites

A 40-year-old man with chronic alcohol intake presented with severe epigastric pain and breathlessness. CT abdomen demonstrated an enlarged pancreas with peripancreatic fat stranding, extensive retroperitoneal fluid collections, and large volume ascites extending into the perihepatic, perisplenic, pararenal space, parabolic gutters and bilateral pleural cavity. No necrosis was identified. CT confirmed acute pancreatitis with extensive ascites. Supportive therapy was instituted.

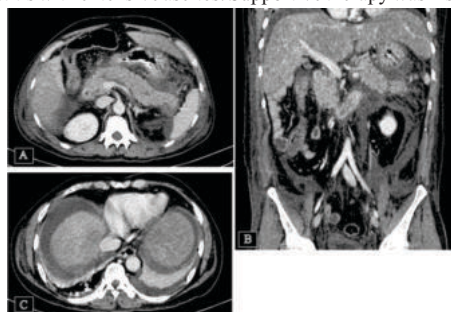


Figure 1: CECT abdomen shows Bulky pancreas with peripancreatic fat stranding (A); extensive ascites involving bilateral paracolic gutters, pelvis and perigastric region (B); perihepatic and perisplenic fluid with left sided pleural effusion (C)

Case 2 : Chronic Pancreatitis Complicated By Gastric Perforation.

A 48 year old man, known chronic alcoholic, presented to the emergency department with diffuse abdominal pain, guarding and shock. CT images revealed diffuse parenchymal atrophy, multiple parenchymal calcifications within the pancreatic parenchyma and dilated MPD. However, no evidence of acute pancreatitis was noted. Then we found an extraluminal foci of air in the lesser sac, which was seen tracking through the lateral wall of pylorus. These findings were

consistent with a concealed gastric perforation on a patient clinically suspected as pancreatitis.

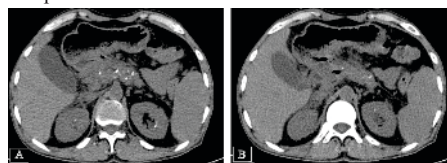


Figure 2 Non contrast CT abdomen shows (A) atrophic pancreas with multiple intraparenchymal calcifications and dilated main pancreatic duct; (B) few tiny foci of extraluminal air tracking to the lateral wall of pylorus.

Case 3: Emphysematous Pyelonephritis

A 47-year-old diabetic man presented with fever, flank pain, and altered sensorium. CT abdomen revealed an enlarged left kidney with multiple foci of gas within the parenchyma, with cortical irregularity and extensive perinephric fat stranding. Findings suggested a diagnosis of emphysematous pyelonephritis. Percutaneous drainage and intravenous antibiotics were initiated with good response.



Figure 3 Non contrast CT KUB shows (A) few foci of air within the left renal substance; (B) extensive perirenal fat stranding with thickening of Gerota's fascia.

Case 4: Ectopic Kidney With Pyelonephritis

A 67-year-old woman presented with fever and pelvic pain. CT urography demonstrated an ectopic left kidney located in the pelvis, showing mild atrophy, diffuse cortical hypodensities, perinephric fluid collection and fat stranding. These findings were diagnostic of pyelonephritis in an ectopic kidney.

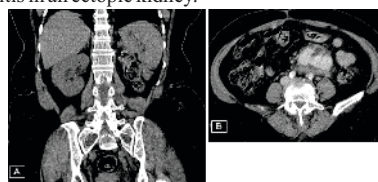


Figure 4 : Non contrast CT abdomen in coronal reformatted format (A) shows empty left renal fossa with a normal right kidney; Contrast enhanced CT abdomen (B) in nephrogenic phase shows ectopic renal tissue in left iliac fossa with perinephric fluid collection and fat stranding.

Case 5: Chronic Cystitis

A 73-year-old man with h/o of chronic catheterization presented with fever and suprapubic pain. CT urography showed diffuse circumferential bladder wall thickening with mucosal enhancement, perivesical stranding, and multiple well defined focal non enhancing cortical hypodensities in the right kidney with perinephric fat stranding, consistent with cystitis with incidental cysts and mild inflammatory changes.B

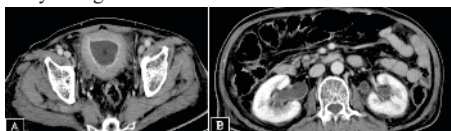


Figure 5: CECT abdomen shows (A) extensive circumferential wall thickening involving the bladder with pericystic fat stranding; (B) mild dilated ureters and minimal perinephric fat stranding, suggesting inflammatory changes.

Case 6: Mesenteric Ischemia After Cesarean Section

A 35-year-old woman developed severe abdominal pain on day 3 post-cesarean section. CT angiography revealed occlusion of the superior mesenteric artery with an area of focal mesenteric fat stranding, suggesting mesenteric ischemia. She underwent emergency laparotomy with bowel resection and SMA embolectomy.

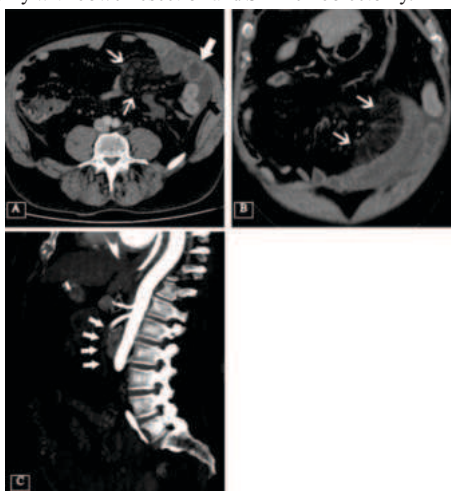


Figure 6: CECT abdomen (A, B) shows focal area of fat stranding within the mesentery and mild adjacent bowel wall edema; (C) MIP sagittal reformatted image shows filling defect within the superior mesenteric artery indicating mesenteric artery embolism.

Case 7: Appendicular Abscess

A 40-year-old woman presented with right pain and fever for the past 3 days. CT images revealed a circumscribed area of hypodense soft tissue with extensive fat stranding in right iliac fossa near the ileocaecal junction. An area of well-defined calcification was noted within what appeared to be the appendix. The findings were favoring the diagnosis of appendicolith causing acute appendicitis complicated by abscess formation. She underwent percutaneous drainage and later an interval appendectomy.

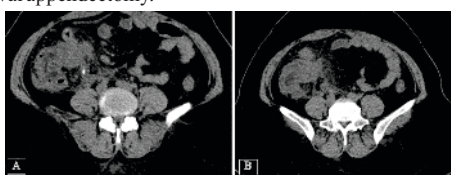


Figure 7: Non contrast CT abdomen (A) shows ill-defined collection with fat stranding in the right iliac fossa with an appendicolith; (B) caudally shows the confined collection and fat stranding.

Case 8: Hepatic Abscess

A 40-year-old man with recent dysentery presented with fever and right upper quadrant pain. CT abdomen revealed multiple hypodense lesions in the both lobes of liver with irregular peripheral rim enhancement and incomplete internal septations, diagnostic of a hepatic abscess. CT-guided drainage was performed and intravenous antibiotics administered.

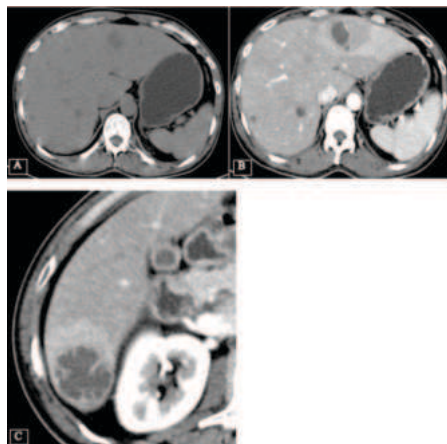


Figure 8: Non contrast abdomen (A) shows multiple hypodense lesions in both lobes of liver; (B) axial contrast images in portal venous phase shows peripherally enhancing lesions in the corresponding areas; (C) zoomed view of the largest lesion in right lobe shows a peripherally enhancing lesion with incomplete internal enhancing septations.

Case 9: Cholangiocarcinoma with Hepatic Metastases

A 67-year-old man presented with abdominal pain and weight loss. CT abdomen showed multiple hypodense liver lesions predominantly in right lobe of liver with few lesions in left lobe. The large lesion is associated with capsular retraction and delayed enhancement while the smaller satellite lesions appear to be metastasis. These findings are consistent with cholangiocarcinoma with hepatic metastases. The patient was referred for systemic chemotherapy.

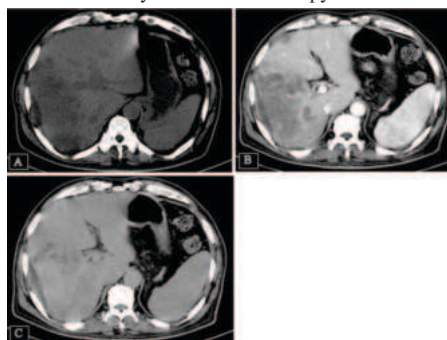


Figure 9: NCCT abdomen (A) shows an ill-defined hypodense lesion in right lobe of liver with adjacent minimal fluid collection; (B) Portal venous phase shows that the lesion is non enhancing and also shows few satellite lesion distant from the major lesion. Adjacent capsular retraction also noted. (C) delayed enhancement of the lesion noted.

DISCUSSION

This series demonstrates the diverse spectrum of acute abdominal conditions that can be accurately characterized using CT. In emphysematous pyelonephritis, CT is superior in detecting gas within the renal parenchyma and perinephric space, enabling early intervention and reducing mortality [1]. In pancreatitis, CT not only confirms diagnosis but also assesses complications including necrosis, fluid collections, and ascites, which are prognostically significant [2]. The patients presenting as chronic pancreatitis can also have complications like gastric perforation, which should be kept in mind. Cystitis and pyelonephritis demonstrates the importance of CT in assessing both bladder wall involvement and renal complications [3]. Mesenteric ischemia, often fatal if missed, is best diagnosed on CT angiography, which directly visualizes vascular occlusion and bowel ischemia [4]. Hepatic abscesses and metastases are well characterized on CT due to differences in enhancement patterns, aiding in differentiation and guiding management [5,6]. CT also enables diagnosis of unusual entities such as ectopic kidneys and peritoneal

sarcomas, where anatomical detail is crucial for planning intervention [7; 8]. Overall, CT remains indispensable for timely diagnosis, guiding surgical versus conservative management, and improving clinical outcomes in acute abdomen.

CONCLUSION

CT imaging is a cornerstone in evaluating acute abdominal emergencies. The presented cases highlight the wide spectrum of pathologies encountered in practice, ranging from infective to vascular to neoplastic conditions. The ability of CT to rapidly identify critical findings makes it the most valuable imaging modality in the acute setting.

REFERENCES

1. Chou, Y. H., et al. (2007). Imaging of emphysematous pyelonephritis. *American Journal of Roentgenology*, 188(4), 1198-1206. <https://doi.org/10.2214/AJR.06.0862>
2. Balthazar, E. J. (2002). Acute pancreatitis: Assessment of severity with clinical and CT evaluation. *Radiology*, 223(3), 603-613. <https://doi.org/10.1148/radiol.2233010680>
3. Nino-Murcia, M., & Jeffrey, R. B. (1996). Imaging of urinary tract infections in adults. *Radiology*, 198(1), 41-51. <https://doi.org/10.1148/radiology.198.1.8539415>
4. Menke, J. (2010). Diagnostic accuracy of multidetector CT in acute mesenteric ischemia: Systematic review and meta-analysis. *Radiology*, 256(1), 93-101. <https://doi.org/10.1148/radiol.10091619>
5. Barakos, J. A., & Jeffrey, R. B. (1990). Hepatic abscess: CT and sonographic findings. *AJR*, 154(4), 763-768. <https://doi.org/10.2214/ajr.154.4.2108557>
6. van Leeuwen, M. S., et al. (1996). Hepatic metastases: Detection with spiral CT and MR imaging. *Radiology*, 201(2), 327-336. <https://doi.org/10.1148/radiology.201.2.8888207>
7. Sivit, C. J. (1993). Imaging the pediatric ectopic kidney. *Pediatric Radiology*, 23(2), 108-112. <https://doi.org/10.1007/BF02015025>
8. Gerber, M., et al. (2008). Desmoplastic small round cell tumor: Imaging findings. *European Radiology*, 18(9), 2129-2136. <https://doi.org/10.1007/s00330-008-0965-2>