

Beyond the Donuts: Diagnostic Uncertainty in Postoperative Anastomotic Leak Evaluation

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Background

- Anastomotic leak is one of the most feared complications following colorectal surgery, with reported rates ranging from 3–15% [1].
- Diagnosis is often challenging, as postoperative sepsis and intra-abdominal fluid collections may mimic leak even in the presence of an intact anastomosis.
- Clinical suspicion, imaging, biomarkers, and intraoperative assessment must be integrated to guide management [2,3,4].

Case Presentation

- We report a 69-year-old female with recurrent diverticulitis, gastroesophageal reflux disease, and obstructive sleep apnea who underwent hand-assisted laparoscopic sigmoidectomy.
- The procedure involved extensive adhesiolysis, resection of inflamed sigmoid colon and upper rectum, and creation of an end-to-end colorectal anastomosis. Intraoperative leak testing was negative, and a pelvic drain was placed.
- Her early postoperative course was notable for leukocytosis (WBC 19K) on POD2, prompting empiric antibiotics. On POD3, she developed emesis and CT imaging revealed a large right lower quadrant fluid collection and a smaller collection adjacent to the anastomosis.
- Concern for leak led to reoperation on POD4, which demonstrated an intact anastomosis with repeat negative leak test but purulent fluid throughout the left hemiabdomen. Small bowel serosal injuries were repaired. Cultures grew *Enterococcus faecalis*.

Case Presentation (continued)

- Despite intervention, she experienced persistent leukocytosis and progressive fluid collections on serial CT scans. She underwent two percutaneous drain placements, each yielding purulent output.
- She was discharged home on intravenous piperacillin/tazobactam and micafungin on POD19 with improving status.



Image 1: Patient's BE prior to sigmoidectomy

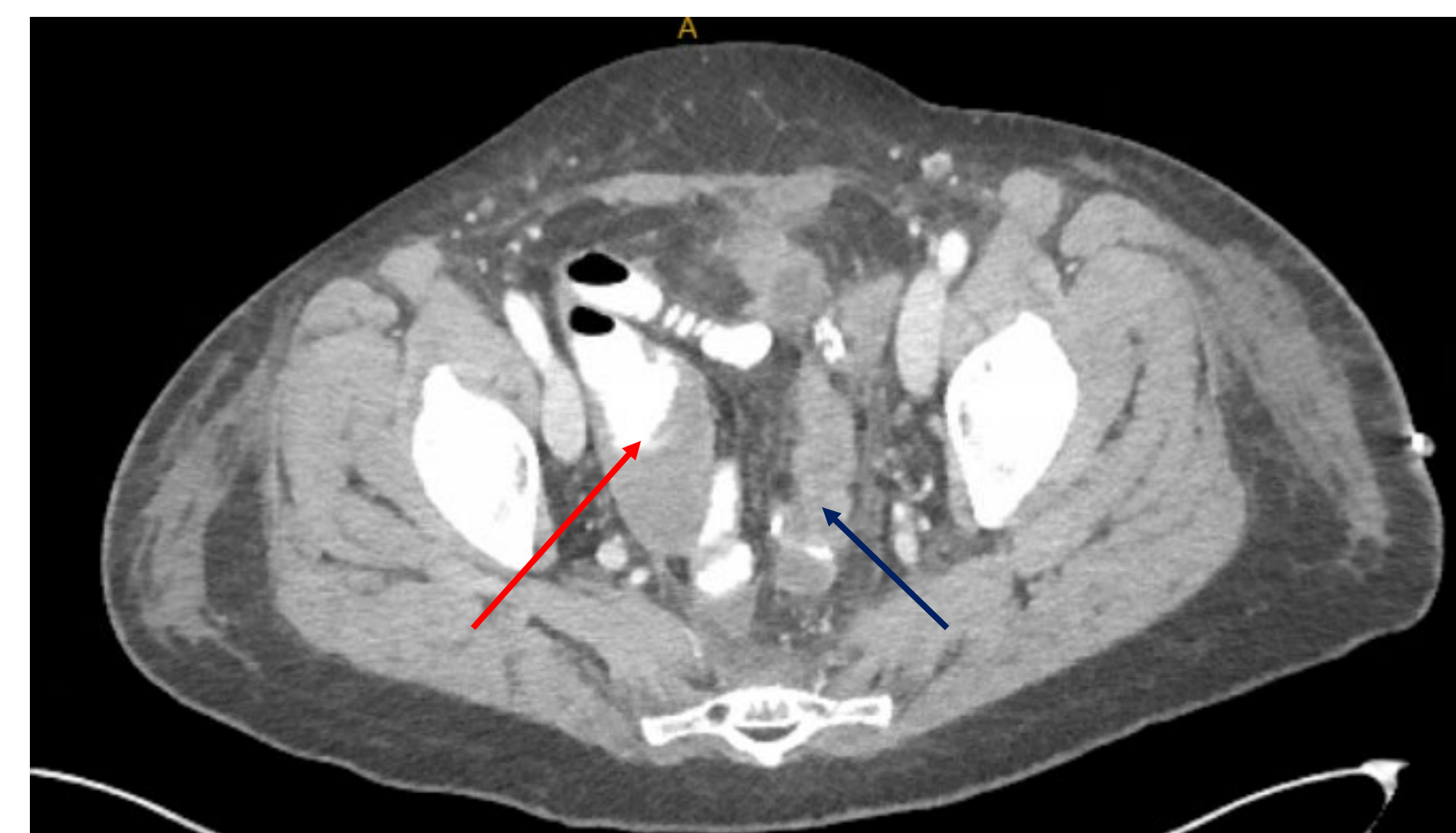


Image 2: CT A/P on POD 3. RLQ fluid collection (red arrow). Staple line (navy arrow)

Discussion

- This case illustrates the diagnostic ambiguity between anastomotic leak and postoperative intra-abdominal infection without disruption of the anastomosis. Reliance on CT imaging alone can be misleading, as perianastomotic collections are not always synonymous with leak [4].
- Biomarkers such as C-reactive protein (CRP) provide valuable adjunctive information. The PREDICT study demonstrated that a CRP rise >50 mg/L between postoperative days 3–5 has 85% sensitivity and a 99% negative predictive value for anastomotic leak [3].
- Similarly, the Dutch leakage score, particularly when combined with procalcitonin and CRP, has shown high diagnostic accuracy [2].
- In this patient, elevated WBC and persistent sepsis suggested ongoing contamination, but repeated negative leak tests and stable anastomosis prevented unnecessary diversion.

Conclusion

- Accurate diagnosis of anastomotic leak requires a multimodal strategy combining clinical suspicion, imaging, biomarkers, and intraoperative confirmation.
- This case underscores the importance of differentiating true anastomotic failure from postoperative sepsis due to localized contamination, thereby guiding appropriate interventions while preserving patient safety.

References: [1] Italian ColoRectal Anastomotic Leakage (iCral) Study Group. Anastomotic leakage after elective colorectal surgery: a prospective multicentre observational study on use of the Dutch leakage score, serum procalcitonin and serum C-reactive protein for diagnosis. *BJS Open*. 2020 Jun;4(3):499-507. doi: 10.1002/bjs.5.50269. Epub 2020 Mar 5. PMID: 32134216; PMCID: PMC7260403. [2] Stephensen BD, Reid F, Shaikh S, Carroll R, Smith SR, Pockney P; PREDICT Study Group collaborators. C-reactive protein trajectory to predict colorectal anastomotic leak: PREDICT Study. *Br J Surg*. 2020 Dec;107(13):1832-1837. doi: 10.1002/bjs.11812. Epub 2020 Jul 16. PMID: 32671825. [3] Su'a B, Milne T, Jaung R, Jin JZ, Svirsakis D, Bissett IP, Eglinton T, Hill AG. Detection of Anastomotic Leakage Following Elective Colonic Surgery: Results of the Prospective Biomarkers and Anastomotic Leakage (BALL) Study. *J Surg Res*. 2022 May;273:85-92. doi: 10.1016/j.jss.2021.12.019. Epub 2022 Jan 13. PMID: 35033821.