

Case Report

Acute Edematous Stump Appendicitis Diagnosed Preoperatively on Sonography

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The inflammation of the appendiceal stump after appendectomy is a rare disease, and its diagnosis is not routinely suspected in patients who have previously undergone appendectomy. Few cases are reported in the medical literature, and only two of these reported cases were diagnosed through CT before surgery [1].

The role of sonography in the diagnosis of acute appendicitis is well established, but its usefulness in the diagnosis of acute edematous stump appendicitis has not yet been assessed. This paper reports a patient with an early inflammation of the appendiceal stump that was preoperatively diagnosed using sonography. It also describes the corresponding sonographic findings.

Case Report

A 13-year-old girl presented with a history of abdominal pain associated with nausea, vomiting, and hyperthermia (38–39°C). She reported that the pain had started 15 days before the consultation and that it was increasing in intensity. At the time of the consultation, it was localized in the right lower quadrant and radiated to the right leg.

She mentioned having undergone appendectomy in another hospital 2 months before the current consultation.

Physical examination revealed guarding over the right lower quadrant during abdominal palpation. Signs of peritoneal irritation in the vicinity of the surgical scar were present. Laboratory analysis showed leukocytosis with a left shift of the WBC (14,000/ μ L) with predominance of immature forms. Sonography showed increased thickness (8 mm) of the residual cecal appendix (Figs. 1A and 1B), two enlarged lymph nodes, and a small amount of fluid in the right iliac fossa.

At video laparoscopy, a residual appendiceal stump was found and removed (Fig. 1C).

Discussion

The inflammation of the appendiceal stump is a rare late complication after appendectomy. Its exact rate of incidence and its prevalence in the population are not accurately defined. A review of medical literature to this date has produced reports of only 15 cases of edematous stump appendicitis. Four of these are recent and occurred after laparoscopic appendectomy [2, 3]. In the 15 cases reported, the time of onset ranged from

3 months to 34 years after appendectomy [1, 4]. In eight cases, the technique used was laparoscopic appendectomy and simple ligation of cecal appendix without stump invagination [4, 5]. A long residual amputation stump, which might be left behind in laparoscopic surgery, is considered a prerequisite for the development of this disease [6].

Results of CT have been reported for only five cases so far [1, 3–5, 7]. In only two was the diagnosis of edematous stump appendicitis suggested before surgery by CT findings. For one of these cases, CT showed a distended appendiceal stump [4], whereas for the other it revealed the presence of an abscess in the form of an appendiceal stump [1]. In the other three cases, CT findings were not specific and revealed an ileocecal mass or pelvic abscess, and diagnosis was confirmed only during surgery.

In the patient reported here, sonography before surgery revealed the appendiceal stump with initial signs of edema of the mucosa. The changes observed were similar to those in acute edematous appendicitis but were found in a short segment of the cecal appendix. Sonography has become the method of choice for the diagnosis of acute appendicitis since Puylaert's technique was

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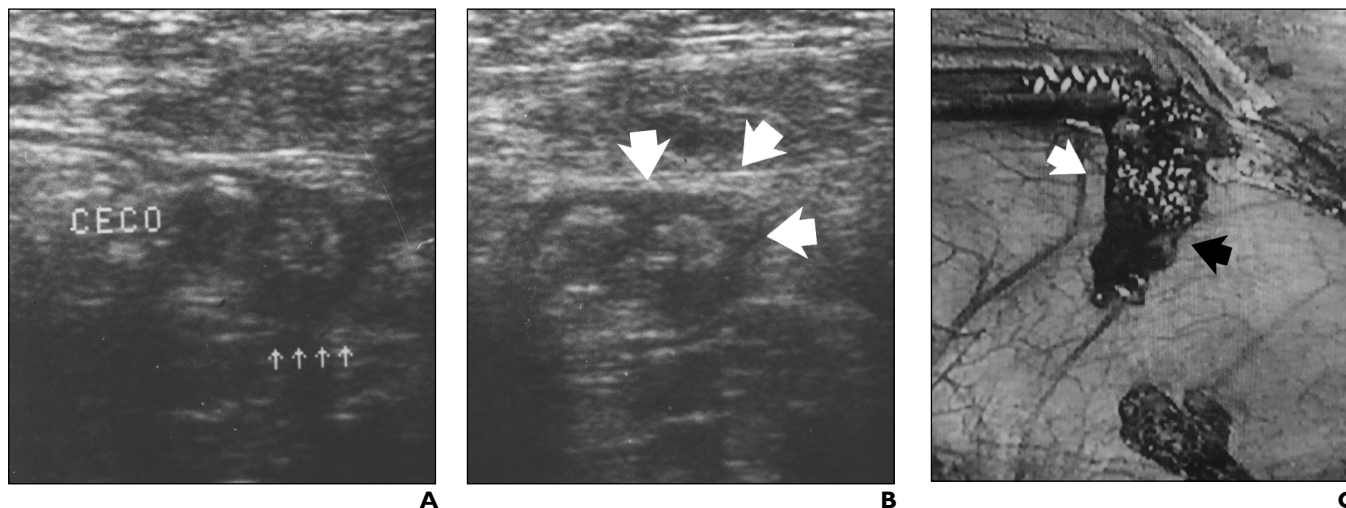


Fig. 1.—13-year-old girl with abdominal pain and suspected appendiceal stump.
A, Longitudinal sonogram shows appendiceal stump (arrows). Ceco = cecum.
B, Transverse sonogram shows appendiceal stump (arrows).
C, Photograph from video laparoscopy shows residual appendiceal stump (arrows).

adopted [8]. However, its usefulness in the identification of changes in the appendiceal stump has not been assessed before. In the patient discussed here, sonography proved capable of identifying initial inflammatory changes present in acute edematous stump appendicitis. We suggest, therefore, that early diagnosis of stump appendicitis may be made by sonography alone, as long as the examiner suspects this disease and is familiar with its sonographic findings. It is thus possible to avoid a delayed diagnosis

or the use of more sophisticated examinations such as CT.

References

1. Rao PM, Sagarin MJ, McCabe CJ. Stump appendicitis diagnosed preoperatively by computed tomography. *Am J Emerg Med* **1998**;16:309-311
2. Devereaux DA, McDermott JP, Caushaj PF. Recurrent appendicitis following laparoscopic appendectomy: report of a case. *Dis Colon Rectum* **1994**; 37:719-720
3. Wright TE, Diaco JF. Recurrent appendicitis after laparoscopic appendectomy. *Int Surg* **1994**;79:251-252
4. Thomas SE, Denning DA, Cummings MH. De-

5. Harris CR. Appendiceal stump abscess ten years after appendectomy. *Am J Emerg Med* **1989**;7:411-412
6. Scott-Conner CE, Hall TJ, Anglin BL, Muakkassa FF. Laparoscopic appendectomy. *Ann Surg* **1992**; 125:660-667
7. Filipi de la Palavesa MM, Vaxmann D, Campos M, et al. Appendiceal stump abscess. *Abdom Imaging* **1996**;21:65-66
8. Puylaert JB. Acute appendicitis: US evaluation using graded compression. *Radiology* **1986**;158:355-360

This article has been cited by:

1. María A. Casas, Nicolás H. Dreifuss, Francisco Schlottmann. 2022. High-volume center analysis and systematic review of stump appendicitis: solving the pending issue. *European Journal of Trauma and Emergency Surgery* 48:3, 1663-1672. [[Crossref](#)]
2. Talal Almas, Vikneswaran Raj Nagarajan, Danyal Ahmed, Muneeb Ullah, Mohammed Ali Ashary, Mert Oruk, Arsalan Khan, Kiran Amin, Uzair Malik, Joshua Ramjohn, Helen Huang, Ali Rifai, Ahlam Alzahrani, Nagi Alqallaf, Sood Alsairefi, Yeoreum Summer Hur, Anhad Bhullar, Khadeer Abdulkarim, Eissa Alwheibi, Mhmod Kadom, Aaisha Alshabibi, Adil Shafi, Faisal Murad, Emad Mansoor. 2022. Recurrent appendicitis of vermiform appendix after a prior appendectomy: A case report and review of the literature. *Annals of Medicine and Surgery* 77, 103603. [[Crossref](#)]
3. Sajad Ahmad Salati. 2021. Stump appendicitis – a systematic analysis. *Polish Journal of Surgery* 94:1, 1-5. [[Crossref](#)]
4. Anil Kumar M S, D. Shiva Manohar. 2020. PROMPT RECOGNITION OF STUMPAPPENDICITIS IS IMPORTANT TO AVOID SERIOUS COMPLICATIONS: A CASE REPORT. *INDIAN JOURNAL OF APPLIED RESEARCH* 1-2. [[Crossref](#)]
5. Enis Dikicier, Fatih Altintoprak, Kayhan Ozdemir, Kemal Gundogdu, Mustafa Yener Uzunoglu, Guner Cakmak, Feyyaz Onuray, Recai Capoglu. 2018. Stump appendicitis: a retrospective review of 3130 consecutive appendectomy cases. *World Journal of Emergency Surgery* 13:1. . [[Crossref](#)]
6. Tristan Reddan, Jonathan Corness, Jennifer Powell, Fiona Harden, Kerrie Mengersen. 2017. Stumped? It could be stump appendicitis. *Sonography* 4:1, 36-39. [[Crossref](#)]
7. Andrés Guillermo Ramírez, Fernando Fierro, Diana Alejandra Holguín, Mizrahinn Méndez. 2017. Stump appendicitis in a 2 year-old patient. Case report and literature review. *Case reports* 3:1. . [[Crossref](#)]
8. Dae Hyun Kim. 2016. Ultrasonography of Appendicitis. *Clinical Ultrasound* 1:1, 19-38. [[Crossref](#)]
9. Jennifer Johnston, Daniel T. Myers, Todd R. Williams. 2015. Stump appendicitis: surgical background, CT appearance, and imaging mimics. *Emergency Radiology* 22:1, 13-18. [[Crossref](#)]
10. Elena Martínez Chamorro, Alicia Merina Castilla, Beatriz Muñoz Fraile, Laura Koren Fernández, Susana Borrueal Nacenta. 2013. Stump appendicitis: preoperative imaging findings in four cases. *Abdominal Imaging* . [[Crossref](#)]
11. Yifan Yang, Tyler R. Clark, Ho H. Phan. 2012. Stump appendicitis after childhood incidental appendectomy. *Journal of Pediatric Surgery* 47:11, e15-e17. [[Crossref](#)]
12. Anuradha Subramanian, Mike K. Liang. 2012. A 60-year literature review of stump appendicitis: the need for a critical view. *The American Journal of Surgery* 203:4, 503-507. [[Crossref](#)]
13. D. R. Leff, M. R. Sait, M. Hanief, S. Salakianathan, A. W. Darzi, R. Vashisht. 2012. Inflammation of the residual appendix stump: a systematic review. *Colorectal Disease* 14:3, 282-293. [[Crossref](#)]
14. Hala Kanona, Ahmad Al Samaraee, Colin Nice, Vish Bhattacharya. 2012. Stump appendicitis: A review. *International Journal of Surgery* 10:9, 425-428. [[Crossref](#)]
15. Xiao Bing Tang, Ri Bin Qu, Yu Zuo Bai, Wei Lin Wang. 2011. Stump appendicitis in children. *Journal of Pediatric Surgery* 46:1, 233-236. [[Crossref](#)]
16. Rakesh Sinha. Appendix, colon and rectum 388-410. [[Crossref](#)]
17. Donal P O'Leary, Eddie Myers, Joe Coyle, Ian Wilson. 2010. Case report of recurrent acute appendicitis in a residual tip. *Cases Journal* 3:1. . [[Crossref](#)]
18. Jason Romesburg, Khursheed Imam. 2010. Stump appendicitis. *Applied Radiology* 72, 36-38. [[Crossref](#)]
19. Hossein Salehi, Seyed Hadi Anjamrooz. 2008. Successfully treated stump appendicitis diagnosed by CT and ultrasonography. *Indian Journal of Surgery* 70:2, 89-91. [[Crossref](#)]
20. Álvaro Sanabria, Javier Romero, Miguel Angarita, Juan Carlos Varón. 2008. Costo-efectividad de la tomografía computarizada y la ecografía en el diagnóstico de apendicitis. *Biomédica* 28:1, 139. [[Crossref](#)]
21. Muhammad Waseem, Gerard Devas. 2008. A Child with Appendicitis After Appendectomy. *The Journal of Emergency Medicine* 34:1, 59-61. [[Crossref](#)]
22. Artur Bijoś, Artur Mazur, Mieczysława Czerwionka-Szaflarska. 2007. Rola badania ultrasonograficznego w wybranych chorobach przewodu pokarmowego u dzieci. *Pediatrics Polska* 82:9, 722-726. [[Crossref](#)]
23. A. Guisasola Íñiguez, M. Leunda Iruretagoyena, A. Villanueva Mateo, A. Nogués Pérez. 2007. Apendicitis de muñón apendicular. Una nueva observación. *Anales de Pediatría* 66:5, 539-540. [[Crossref](#)]
24. I.D. Carcacia, J.L. Vázquez, M. Iribarren, H. Pardellas. 2007. Diagnóstico preoperatorio por métodos de imagen de una apendicitis del muñón. *Radiología* 49:2, 133-135. [[Crossref](#)]

25. Mike K. Liang, Helen G. Lo, Jenifer L. Marks. 2006. Stump Appendicitis: A Comprehensive Review of Literature. *The American Surgeon* 72:2, 162-166. [[Crossref](#)]
26. Mehmet Uludag. 2006. Stump appendicitis is a rare delayed complication of appendectomy: A case report. *World Journal of Gastroenterology* 12:33, 5401. [[Crossref](#)]
27. Lewis K. Shin, David Halpern, Shiobhan R. Weston, Evan M. Meiner, Douglas S. Katz. 2005. Prospective CT Diagnosis of Stump Appendicitis. *American Journal of Roentgenology* 184:3_supplement, S62-S64. [[Citation](#)] [[Full Text](#)] [[PDF](#)] [[PDF Plus](#)]
28. Miriam T. Aschkenasy, Frank J. Rybicki. 2005. Acute appendicitis of the appendiceal stump. *The Journal of Emergency Medicine* 28:1, 41-43. [[Crossref](#)]
29. Brian P Watkins, Shanu N Kothari, Jeffrey Landercasper. 2004. Stump Appendicitis. *Surgical Laparoscopy, Endoscopy & Percutaneous Techniques* 14:3, 167-171. [[Crossref](#)]
30. Pierre Nahon, Stephane Nahon, Jean-Marc Hoang, Laurent Traissac, Nicolas Delas. 2002. Stump appendicitis diagnosed by colonoscopy. *The American Journal of Gastroenterology* 97:6, 1564-1565. [[Crossref](#)]
31. Hideyuki Ajisaka, Etsuro Bando, Toshiaki Yasui, Hideto Fujita, Masahide Kaji, Hironobu Kimura, Kiichi Maeda, Kazuhisa Yabushita, Kohji Konishi. 2002. Stump Appendicitis: Report of Four Cases. *The Japanese Journal of Gastroenterological Surgery* 35:2, 189-193. [[Crossref](#)]