J Gastrointest Surg
https://doi.org/10.1007/s11605-017-3636-2

GI IMAGE

IgG4-Related Disease of the Appendix

Fadl H. Veerankutty[1] · **Suhail Saleem**[2] · **Sidharth Chacko**[1] · **Vipin I. Sreekumar**[1] · **Prasad Krishnan**[1] · **Deepak Varma**[1] · **Prakash Kurumboor**[1]

Received: 25 October 2017 / Accepted: 7 November 2017

Keywords Appendix · Mucocele · IgG4-related disease · Right iliac fossa mass

Case

A 57-year-old gentleman presented with dull aching pain in the right iliac fossa (RIF) and weight loss for last 4–5 months. There was no history of fever, vomiting, anorexia, gastrointestinal bleed, altered bowel habits, and respiratory or urinary symptoms. Past medical history was not significant except for diabetes. On clinical examination, there was a tender firm mass in RIF. Laboratory investigations revealed the following: hemoglobin, 9.7 g/dL; total leukocyte count, 7.7 K/uL; CRP –145 mg/L; CEA –6.16 ng/ml; and normal renal and liver function tests. Abdominal CT showed a hugely dilated appendix with thickened walls. There was intraluminal fluid density with bubbles of gas and a fecalith inside. The rest of the abdominal organs appeared normal (Fig. 1a). Considering the high possibility of it being a malignant mucocele, we decided to proceed with laparoscopic right hemicolectomy. Intraoperatively, there was a 12 × 8-cm appendiceal tumor with adherent omentum.

Surprisingly, histopathological examination of cut section of appendix demonstrated a lesion with patchy dense lymphoplasmacytic infiltration of submucosa with perivascular lymphoplasmacytic cuffing (Fig. 1b, c) and focal storiform pattern (cart wheel appearance) of fibrosis (Fig. 1d). Extensive areas of collagenization were also noted. Adjacent colon appeared histologically unremarkable. Pericolic lymph nodes showed only reactive changes. On immunohistochemical analysis (IHC), there was abundant infiltration of IgG4-positive plasma cells with high ratio of IgG4-positive to IgG-positive plasma cells per high-power field (IgG4/IgG= 100/240 = 41.66%) (Fig. 2a, b). Hence, though rare, a diagnosis of IgG4-related disease (IgG4-RD) of appendix was made.[1, 2] Patient is currently asymptomatic and has gained weight at 3 months of follow-up.

Discussion

IgG4-RD is an increasingly recognized immune-mediated condition affecting predominantly middle-aged and older men. The disease frequently presents both clinically and radiologically with features that mimic malignancy. Pancreas is the most common intra-abdominal organ affected, followed by the biliary tract. Involvement of the

✉ Fadl H. Veerankutty
fadl_05@yahoo.com

[1] Department of GI and HPB Surgery, Aster Medcity, Cochin 682027, India

[2] Department of Pathology, Aster Medcity, Cochin 682027, India

Published online: 29 November 2017

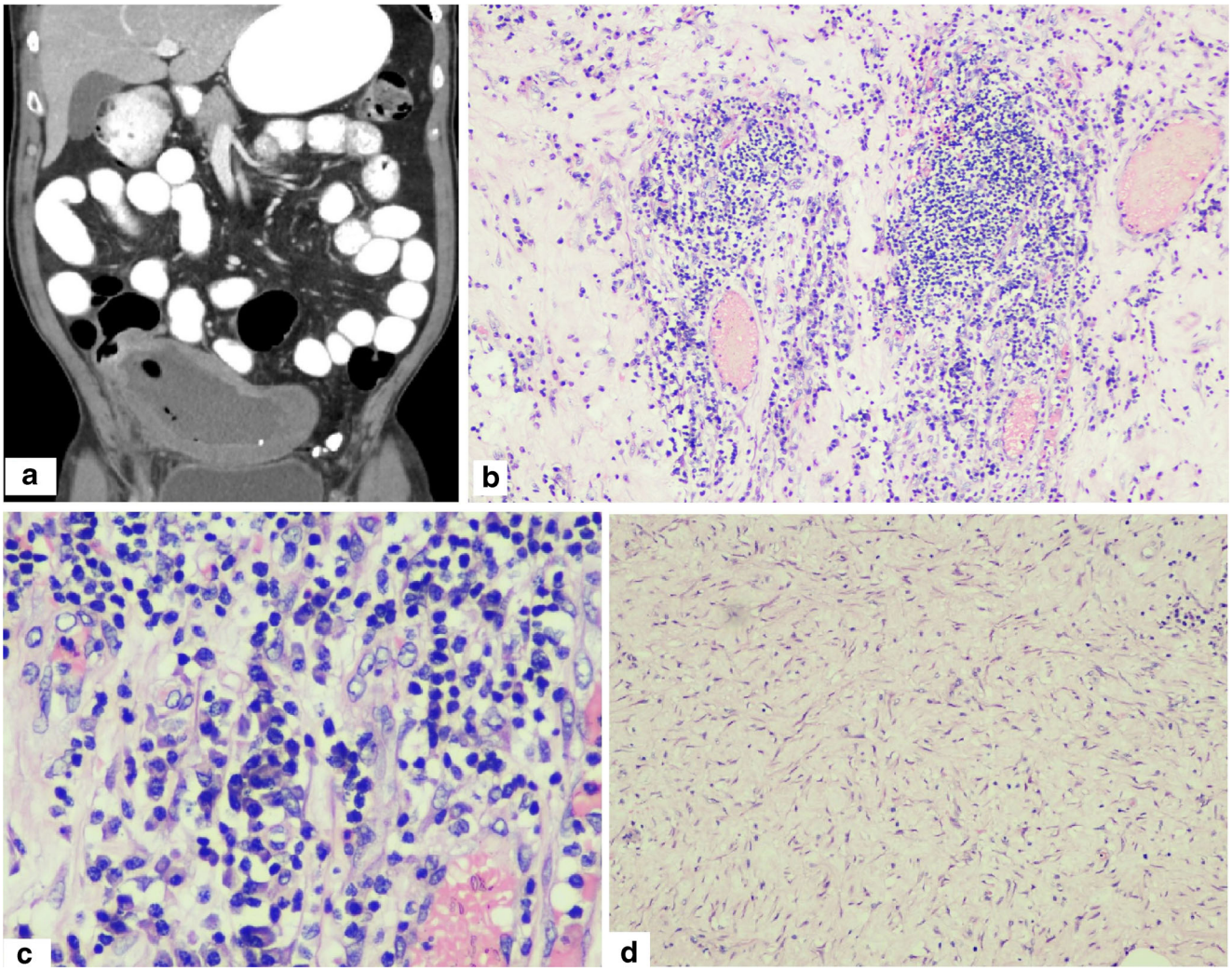

Fig. 1 **a** CT abdomen shows an enlarged appendix mimicking a mucocele with fecalith and air inside. **b** and **c** H & E staining of specimen demonstrating dense patchy lymphoplasmacytic infiltration with perivascular lymphoplasmacytic cuffing under low-power field and high-power field, respectively. **d** Demonstrates the characteristic storiform pattern of fibrosis observed

tubular gut is unusual.[1] In fact, only one case of IgG4-RD of appendix has been reported previously in the literature.[2]

Diagnosis of IgG4-RD remains a significant clinical challenge, and there is no simple diagnostic test for IgG4-RD. Imaging features are atypical and most cases are detected only after surgery. The critical histological features are a dense lymphoplasmacytic infiltrate, a storiform pattern of fibrosis, and obliterative phlebitis. The presence of at least two of above-mentioned histological characteristics should raise a high suspicion of IgG4-RD.[1] Hallmark histological features associated with an increased ratio of IgG4/hpf to IgG/hpf on IHC are still the gold standard for confirmation of diagnosis, whereas serum IgG4 level has been shown to be neither necessary nor sufficient for the diagnosis.[3] Glucocorticoids are the mainstay of treatment if the condition is diagnosed preoperatively. Immunomodulatory drugs such as azathioprine and B cell depletion with rituximab (an anti-CD20 antibody) are other alternatives.[3]

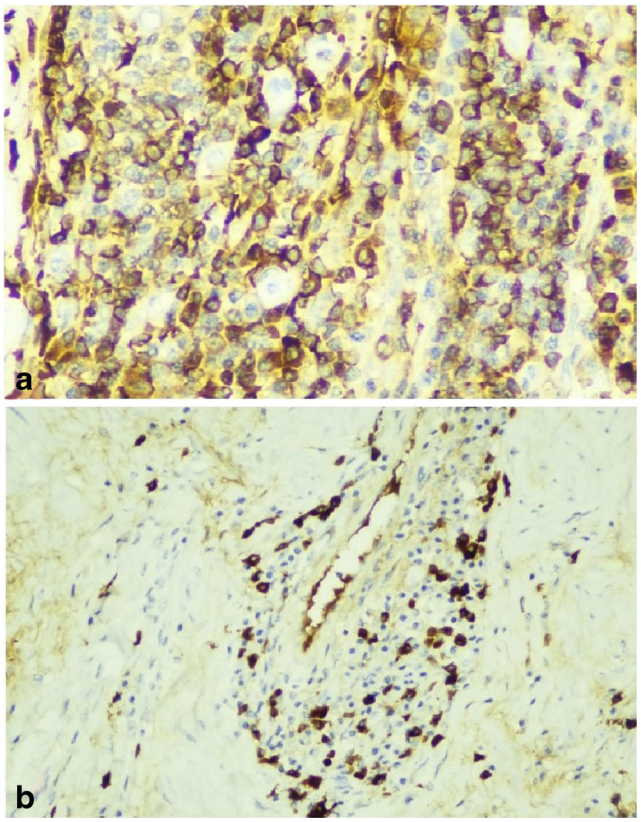

Fig. 2 Immunohistochemical analysis of specimen. **a** IgG^+ plasma cells-240/hpf. **b** $IgG4^+$plasma cells—100/hpf, IgG4/IgG = 41.66%

Authors' Contributions Fadl H Veerankutty prepared the draft manuscript. Suhail Saleem and Sidarth Chacko contributed to the histopathological details of the manuscript, prepared the photomicrographs, and helped in drafting the manuscript. Vipin I Sreekumar, Prasad Krishnan, and Deepak Varma contributed to the radiological details and helped in preparing the whole manuscript. Prakash Kurumboor helped in preparing the draft and edited the final manuscript. All authors have read and approved the final manuscript.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no competing interests.

References

1. Koizumi S, Kamisawa T, Kuruma S, et al. Immunoglobulin G4-related gastrointestinal diseases, are they immunoglobulin G4-related diseases. World Journal of Gastroenterology : WJG. 2013;19(35):5769–5774.
2. Kim HS, Kang WK, Chung DJ. Appendiceal Immunoglobulin G4-related disease mimicking appendiceal tumor or appendicitis: a case report. Korean Journal of Radiology. 2016;17(1):56–58.
3. Kamisawa T, Okazaki K. Diagnosis and treatment of IgG4-related disease. Curr Top Microbiol Immunol. 2017;401:19–33.