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# Appendiceal diverticulum associated with chronic appendicitis

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ABSTRACT

*INTRODUCTION:* Appendiceal diverticulosis is a rare entity, with a global incidence between 0.004% and 2.1% of all appendectomies. It has been related with an elevated risk of perforation in comparison to acute appendicitis, as well as an increased risk for synchronic appendicular cancer in 48% of the cases, and colonic cancer in 43%. The incidence of chronic appendicitis has been reported in 1.5% of all appendicitis cases.

*PRESENTATION OF CASE:* We present a 73-year-old female, with no relevant familial history, who presented due to a four-month-long oppressive, moderate pain in the lower right abdominal quadrant without irradiation or any other accompanying symptoms.

*DISCUSSION:* The documented incidence of appendiceal diverticula and chronic appendicitis by themselves is low; therefore the presence of both entities at the same time is extremely rare.

*CONCLUSION:* We present a case in which both diagnoses concurred in the same patient. The relevance of this case relies on the importance of the adequate knowledge of these pathologies, so we can approach them correctly. Although it does not represent an absolute surgical emergency, appendectomy represents the first therapeutic option.



## 1. Introduction

Appendiceal diverticulosis is a rare entity, with a global incidence between 0.004% and 2.1% of all appendectomies.[1] Two types have been described: acquired and congenital; the last one being the most frequent.[2,3] It has been related with an elevated risk of perforation in comparison to acute appendicitis,[2] as well as an increased risk for synchronic appendicular cancer in 48% of the cases, and colonic cancer in 43%.[3] The incidence of chronic appendicitis has been reported in 1.5% of all appendicitis cases.[4] Even though the clinical presentation of an appendiceal diverticulum is similar to acute appendicitis, there is no well-established diagnostic algorithm for chronic appendicitis,[4] so it is a diagnostic challenge to detect both pathologies on a single patient.

## 2. Presentation of case

We present a 73-year-old female, with no relevant familial history. She presented due to a four-month-long oppressive, moderate pain in the lower right abdominal quadrant without radiation or any other accompanying symptoms, which partially relieve to NSAID's. This symptomatology occurred in five occasions, lasting three days each one.

She was admitted to our hospital, in order to initiate a study protocol. Her complete blood work was within normal range. The CT scan with IV and oral contrast reported an increased appendiceal diameter in its middle (1.3 cm) and distal thirds (1.8 cm), with contrast agent visible only in the base, in relation with a probable infiltrative process or a mucocele (Fig. 1). A colonoscopy was solicited in order to discard a caecal tumour, finding a 5 mm rectal polyp, sigmoid diverticulosis, and a normal caecal and appendiceal base.

With these findings, a laparoscopic appendectomy was performed without complications, identifying a thickened, hyperaemic and edematous caecal appendix in its middle and distal thirds, with a diverticulum in the distal third, and firm and lax epiploic adhesions (Fig. 2). The transoperative histopathological

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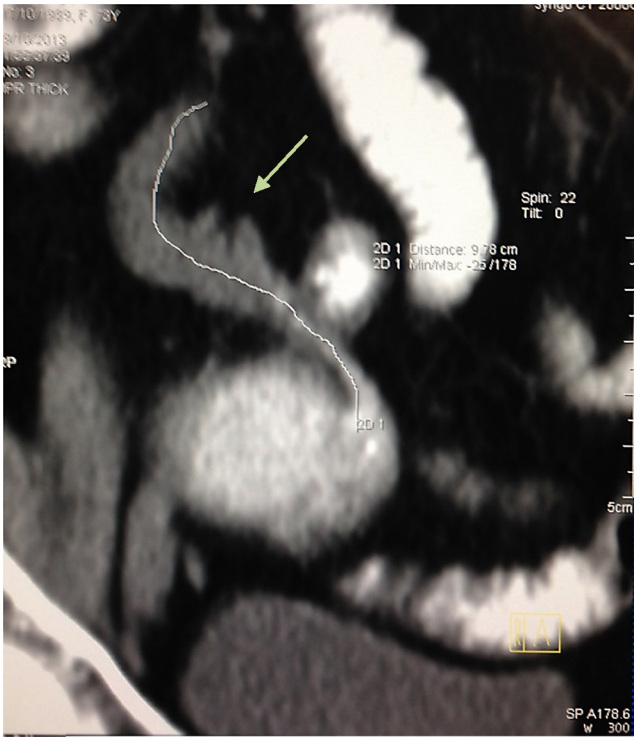


**Fig. 1.** Abdomen CT with oral and IV contrast showing thickened caecal appendix.

analysis reported: dilated, elbowed caecal appendix, with mucinous liquid, and a distal diverticulum; no neoplastic identifiable lesion. Therefore, the surgical procedure was then finalized. The surgical specimen was sent for definitive histopathological analysis, which reported: caecal appendix with diverticulum, muscularis propia layer with accentuated hyperthophy, and fibroplastic focal peritonitis with fibrous appendicular adhesions, without acute inflammatory process, nor neoplastic lesion, compatible with chronic appendicitis (Figs. 3–5).

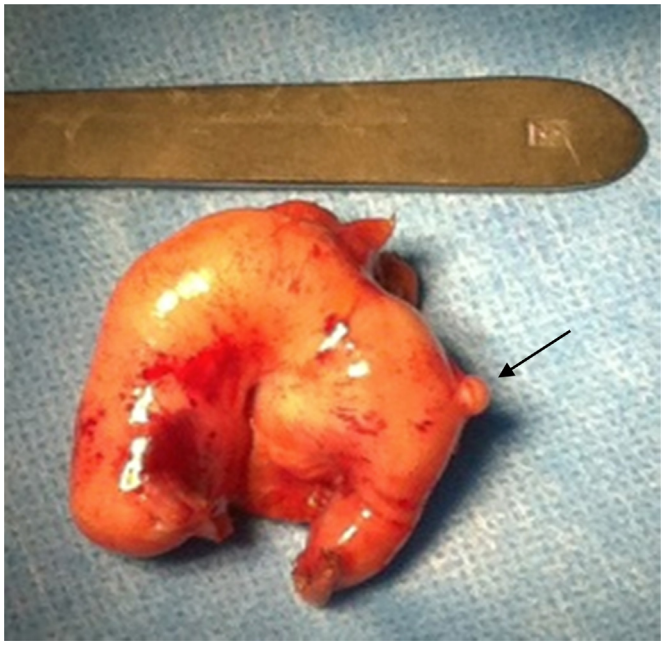

**Fig. 2.** Caecal appendix with diverticulum.

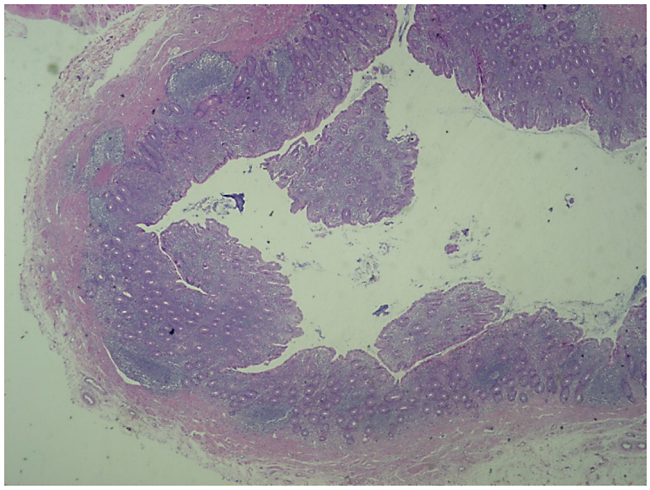

**Fig. 3.** Appendiceal diverticulum.

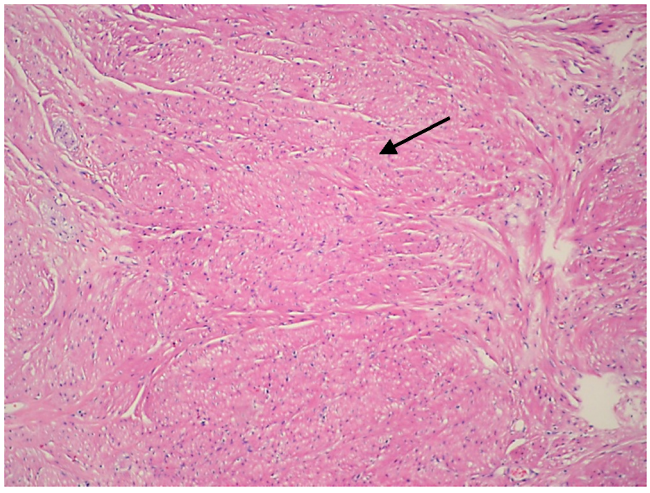

**Fig. 4.** Hypertrophic appendiceal muscularis propia.

The patient continued with favourable clinical evolution, and was discharged two days after the surgical procedure. At the three-month follow up appointment, she continued asymptomatic and without any postoperative complications.

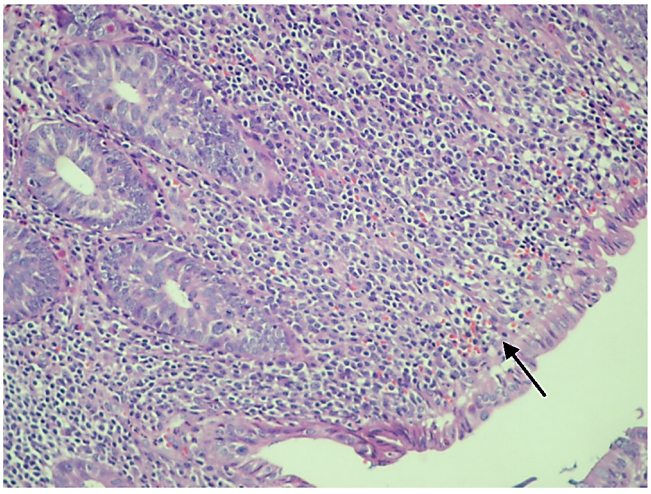

**Fig. 5.** Appendiceal mucosa without acute inflammation.

## 3. Discussion

The documented incidence of appendiceal diverticula and chronic appendicitis by themselves is low,[1,4] therefore the presence of both entities at the same time is extremely rare. The mean age for presentation for appendiceal diverticulum is 33.6 ± 8.33 years, and 52–83.3% of the cases present within male gender[3]; however, our patient does not belong in the aforementioned groups.

Congenital appendiceal diverticula involve all the layers of the appendiceal wall, especially with important thickening of the muscularis propia layer. However, in acquired appendiceal diverticula, that layer is absent, and they are developed secondary to a weakness in the muscular layer in the appendicular mesenteric side.[5] In our patient, hypertrophy of the muscularis propia layer was reported, so we can conclude that our surgical specimen was a congenital appendiceal diverticulum.

Appendiceal diverticulosis commonly has an asymptomatic course. In chronic appendicitis there is usually chronic abdominal pain and it has been mentioned that insspisated intraluminal appendicular secretion and transitory occlusion of the appendiceal lumen may contribute to the physiopathology.[5] So, in this patient the chronic abdominal pain may be more attributable to the chronic appendicitis than to the appendiceal diverticulosis. Even though in patients with acute appendicitis there are well-established diagnostic algorithms that includes specific clinical data such as leucocytosis, atypical and chronic presentations are less frequent and usually lack such characteristics,[4] similar to our patient.

The ultrasound and CT are the most useful imaging modalities for this pathology, being the latter more useful than ultrasound; it has a sensitivity and specificity of 80% and 100% respectively, for the diagnosis of appendiceal diverticulitis and more than 95% for acute appendicitis. It is considered the best initial study in patients with abdominal pain.[1,5] Nevertheless, the usefulness of both studies is limited by the radiologist's experience so we should not base our therapeutic conduct solely on this studies.[6] Laparoscopy can be very helpful, especially in cases in which we cannot reach a radiologic diagnosis, having both diagnostic and therapeutic value. Appendectomy is recommended whenever the diagnosis of appendiceal diverticulum or chronic appendicitis is made, so we can avoid complications and the risk of a malignant tumour.[1,5] This is the most useful approach that completely resolves the chronic pain due to a chronic appendicitis.[4]

The most frequent appendiceal diverticulae complications reported are: perforation (66% incidence, 4 times more often and 30% higher mortality rate than acute appendicitis), massive gastrointestinal tract haemorrhage, abscesses and peritoneal pseudomyxoma.[1] At the three-month follow-up appointment, our patient remained asymptomatic and without any postoperative complications.

## 4. Conclusion

Even though the isolated incidence of chronic appendicitis and appendiceal diverticulosis is low, we present a case in which both diagnoses concurred in the same patient. The relevance of this case relies on the importance of the adequate knowledge of these pathologies, so we can approach them correctly. Although it does not represent an absolute surgical emergency, appendectomy represents the first therapeutic option, especially with the high risk of perforation or synchronic malignancy.

## Conflict of interest

No conflict of interest for any of the authors in this case report.

## Funding

No funding was received specially for this study.

## Ethical approval

The patient consent was obtained at the first hospitalization; our local ethics committee reviewed the case prior to its submission for publication.

## Author contributions

Gregorio Zubieta-OF́arrill performed data collection, analysis, and writing. Jose Raul Guerra-Mora, Gilberto Bernabe Cornejo-Lopez, and Eduardo Villanueva-Saenz did data collection. Andres Gudiño-Chavez and Carlos Gonzalez-Alvaradodid analysis and writing.

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