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Case Report

Fibrous obliteration of the appendix (appendiceal neuroma) masquerading as acute appendicitis in an adolescent with coexisting pelvic endometriosis and adnexal cysts: a case report

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ABSTRACT

Right iliac fossa (RIF) pain in adolescent females presents a broad differential spanning surgical and gynaecological pathology. An 18-year-old unmarried, nulliparous woman with polycystic ovarian syndrome presented with a 20-day history of worsening RIF pain. Abdominal contrast-enhanced computed tomography demonstrated a complex right adnexal cystic lesion adherent to the adnexal pedicle, an obscured appendix, and features of deep pelvic endometriosis. She underwent combined laparoscopic surgery involving excision of a right fimbrial cyst, ablation of pouch of Douglas endometriosis, drainage and cautery of left ovarian follicular cysts, and appendicectomy for an appendix that appeared grossly acutely inflamed with dense caecal bands. Histopathological examination of the appendix revealed complete fibrous obliteration of the appendiceal lumen (neurogenic appendicopathy / appendiceal neuroma) without active acute inflammation, granuloma, parasite, or malignancy. Postoperative recovery was uneventful. A grossly "inflamed" appendix during laparoscopy can be misleading; histopathology remains the definitive diagnostic gold standard. Coexisting pelvic pathology must be systematically investigated and managed concurrently in young women undergoing surgery for atypical or prolonged lower abdominal pain.

Keywords: Appendiceal neuroma, Neurogenic appendicopathy, Adolescent endometriosis, Fibrous obliteration, Adnexal cyst, Laparoscopy

INTRODUCTION

Acute-on-chronic right iliac fossa (RIF) pain in adolescent and young adult females presents a common yet challenging clinical dilemma due to the close anatomical proximity and symptom overlap between the gastrointestinal and reproductive tracts. Historically considered an adult disease, endometriosis is increasingly recognized in adolescent cohorts presenting with severe dysmenorrhoea or treatment-refractory chronic pelvic pain, with laparoscopic series reporting prevalence rates between 49% and 75%.[1,2] Diagnostic delays spanning several years remain frequent in this demographic, predominantly due to atypical, non-cyclical pain patterns and associated gastrointestinal symptoms.[1,2]

Conversely, acute appendicitis is routinely suspected on clinical and radiological grounds and presumed confirmed intraoperatively by macroscopic evidence of appendiceal hyperaemia, serosal congestion, or luminal distension. However, gross surgical inspection correlates imperfectly with microscopic evaluation. Neurogenic appendicopathy-also termed appendiceal neuroma, neurogenic hyperplasia, or fibrous/fibrolipomatous obliteration of the appendix-is a benign clinicopathological entity characterized by progressive proliferation of neural tissue and spindle cells

within a fibromyxoid matrix that gradually obliterates the appendiceal lumen.[3-6] This process frequently produces right lower quadrant pain indistinguishable from acute appendicitis despite the complete absence of true mucosal ulceration or neutrophilic transmural infiltration on microscopic sectioning.[4-6]

In modern laparoscopic cohorts, up to 9.4% of appendicectomy specimens removed for suspected acute appendicitis are histopathologically classified as neurogenic appendicopathy, with a significant predilection for younger female patients presenting with prolonged or recurrent episodes of abdominal pain.[4] The proposed pathophysiology involves recurrent, subclinical inflammatory insults that stimulate axonal proliferation and the excessive secretion of nociceptive neuropeptides-notably substance P and vasoactive intestinal peptide-which generate localized pain independent of suppurative infection or luminal obstruction.[3,5,6]

Herein, we report an instructive case of an adolescent female who underwent single-stage, collaborative laparoscopic gynaecological and surgical intervention for a complex adnexal mass, pelvic endometriosis, and an intraoperatively "acutely inflamed" appendix, wherein definitive histopathology confirmed fibrous obliteration of the appendix without active inflammation.

CASE REPORT

A single-case study was conducted following standard clinical diagnostic and surgical protocols. Diagnostic work-up included complete physical examination, comprehensive hematological and endocrine profiling, pelvic ultrasonography, and contrast-enhanced computed tomography (CECT) of the whole abdomen. Surgical intervention comprised single-stage, multiport gynaecological and general surgical laparoscopy under general anaesthesia. Tissue specimens obtained intraoperatively were fixed in 10% neutral buffered formalin, processed routinely, embedded in paraffin wax, sectioned at 4-µm thickness, and stained with haematoxylin and eosin (H&E) for histopathological evaluation.

Case history and clinical findings

An 18-year-old unmarried, nulligravid female (P0+0) presented with severe RIF pain of 15–20 days' duration, which had sharply worsened over the preceding 4–5 days. She had a documented history of polycystic ovarian syndrome (PCOS) managed with combined oral contraceptives for two years, stopped one month before presentation. Menstrual history revealed regular cycles accompanied by heavy flow and severe dysmenorrhoea; her last menstrual period was six weeks prior. General physical examination revealed mild pallor with stable vital signs (blood pressure 110/70 mmHg). Abdominal examination revealed localized tenderness in the RIF with a soft, non-rigid abdomen and an admission visual analog pain score of 7/10.

Laboratory parameters showed a haemoglobin of 12.3 g/dl, total leucocyte count of 8,380/mm³, platelet count of 2.55×10^5/mm³, serum prolactin of 28.35 ng/ml, thyroid-stimulating hormone (TSH) of 2.28 µIU/ml, and free T4 of 1.28 ng/dl (Table 1). CECT of the whole abdomen revealed a 5.3 × 3.5 cm complex right adnexal cystic lesion with internal septations adherent to the adnexal pedicle suggestive of an endometrioma, an obscured appendix clustered within adjacent bowel loops, and features of deep pelvic endometriosis.

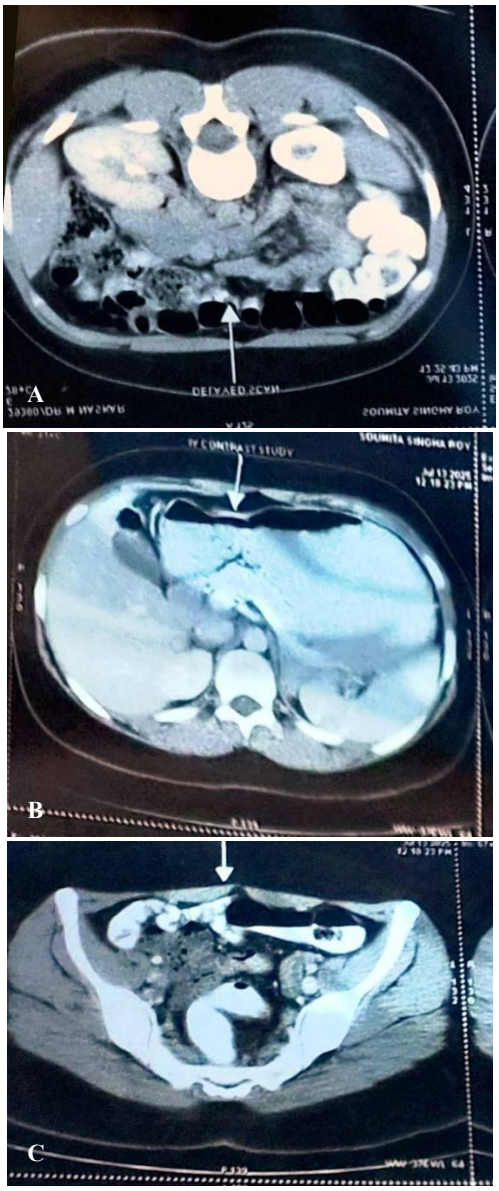


Figure 1 (A-C): Contrast-enhanced computed tomography (CECT) of the abdomen and pelvis showing a complex right adnexal cystic lesion (5.3×3.5 cm) with internal septations adherent to the adnexal pedicle and clustered pelvic bowel loops.

Table 1: Summary of baseline demographic, laboratory, and radiological findings.

Parameters	Clinical findings
Age (years)	18
Marital status / Parity	Unmarried / P0+0 (Nulligravida)
Presenting complaint	Right iliac fossa pain (duration: 15–20 days; acute exacerbation: 4–5 days)
Relevant medical history	Polycystic ovarian syndrome (combined OCP used for 2 years, stopped 1 month prior)
Admission pain score	7/10 (visual analog scale)
Haemoglobin	12.3 g/dl
Total leucocyte count	8,380/mm³
Platelet count	2.55 × 10^5/mm³
Serum prolactin	28.35 ng/ml
TSH / Free T4	2.28 µIU/ml/1.28 ng/dl
Abdominal CECT	5.3×3.5 cm complex right adnexal cystic lesion with internal septations adherent to pedicle; obscured appendix; pelvic endometriosis with adhesions

Operative findings

Combined laparoscopy was executed jointly by the gynaecology and general surgery teams. Gynaecological exploration demonstrated an anteverted, normal-sized uterus. An active endometriotic deposit located in the pouch of Douglas below the left ovarian fossa was ablated. A right fimbrial cyst was excised. The left ovary demonstrated 2–3 follicular cysts, which were aspirated and the bed cauterized; the right ovary and bilateral fallopian tubes appeared grossly normal.

General surgical exploration revealed an appendix that appeared acutely inflamed and tethered by dense caecal bands. The mesoappendix was divided using a harmonic scalpel, and the appendiceal base was secured with two proximal and one distal endoloops prior to transection and retrieval via a 10-mm suprapubic port. Caecal adhesiolysis and peritoneal lavage were completed.

Histopathology

Gross examination of the retrieved appendix measured 4.1 cm in length and 0.5 cm in external diameter with a smooth serosa and an obliterated lumen. Microscopic evaluation showed complete fibrous obliteration of the appendicular lumen by spindle cells and hypertrophied neural elements without mucosal ulceration, neutrophilic infiltration, granulomatous reaction, parasite presence, or neoplastic features. The conclusive histopathological diagnosis was fibrous obliteration of the appendix (neurogenic appendicopathy). The patient experienced an uneventful postoperative recovery and was discharged on oral analgesics with complete resolution of symptoms at outpatient review.

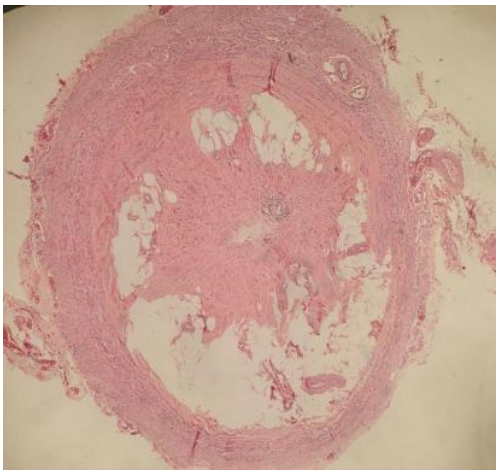


Figure 2: Appendicectomy specimen showing complete fibrous obliteration of the appendiceal lumen by spindle cell proliferation and nerve bundles without acute transmural inflammation (H&E stain).

DISCUSSION

This case illustrates the clinicopathological discordance between macroscopic intraoperative assessment and definitive histopathology in suspected appendicitis, while highlighting the clinical necessity of concurrent gynaecological evaluation in young women presenting with lower abdominal pain.[1,4]

First characterized by Masson et al as "neuroma-like" lesions, neurogenic appendicopathy represents a recognized histological variant in which normal appendiceal architecture is replaced by Schwann cells, neuroendocrine elements, and fibrous stroma.[3,5,6] Despite its benign nature, it can provoke severe and recurrent lower abdominal pain that clinically mimics acute suppurative appendicitis.[4-6] In surgical practice, serosal vascular congestion resulting from local peritoneal irritation, peri-appendiceal adhesive bands, or adjacent pelvic inflammation can readily produce a hyperaemic, thickened appearance that the operating surgeon interprets as acute inflammation.[4,6] Consequently, gross intraoperative appearance must not supersede microscopic examination as the definitive diagnostic standard.

Furthermore, appendiceal endometriosis must be carefully distinguished in reproductive-age females.[7,8] Although our patient harboured documented pelvic endometriosis within the pouch of Douglas and adnexal cystic disease, her appendiceal specimen showed complete absence of endometrial stroma or glandular tissue, confirming that the appendiceal lesion was a distinct neurogenic process rather than extragenital endometriosis.[7,8]

Importantly, had this patient undergone isolated appendicectomy based solely on the assumption of acute appendiceal inflammation, the coexisting pelvic endometriosis and complex adnexal cyst would have remained untreated, leading to persistent or recurrent symptoms.[1,2] A multidisciplinary, single-stage laparoscopic approach ensured definitive diagnosis and comprehensive therapeutic clearance under a single general anaesthetic.

CONCLUSION

Fibrous obliteration of the appendix (neurogenic appendicopathy) represents an under-recognized mimic of acute appendicitis that frequently presents in young females with protracted or recurrent right iliac fossa pain. Gross intraoperative hyperaemia and pericaecal adhesions can be deceptively misleading, reinforcing that histopathological assessment remains the definitive diagnostic gold standard. In adolescent females presenting with lower quadrant pain, systematic multidisciplinary laparoscopic exploration should be routinely undertaken to identify and treat coexisting gynaecological conditions such as pelvic endometriosis and adnexal lesions in a single surgical sitting.

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