Management of Incidentally Discovered Appendiceal Malignancies: When to Perform Right Hemicolectomy – Case Series and Literature Review

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AIM: Appendiceal neoplasms are rare and are most frequently diagnosed incidentally after appendectomy for suspected acute appendicitis. Their optimal management, particularly the indication for completion right hemicolectomy, remains debated due to the absence of standardized guidelines.

CASE PRESENTATION: We present a retrospective case series of four patients who underwent emergency appendectomy for clinical and radiological suspicion of acute appendicitis at Ivrea Hospital between May 2023 and February 2026. Histopathological examination revealed incidental appendiceal malignancies. Clinical, intraoperative, histopathological, and follow-up data were analyzed. A narrative review of the literature was also performed, focusing on current evidence regarding classification, prognostic factors and indications for right hemicolectomy.

RESULTS: Among 178 appendectomies performed during the study period, four cases were diagnosed with appendiceal neoplasms: one neuroendocrine tumor (G1), one non-mucinous adenocarcinoma, one goblet cell adenocarcinoma and one mucinous adenocarcinoma. Completion right hemicolectomy was performed in three cases based on histopathological risk factors, while one patient required no further surgical treatment. One patient presented with peritoneal metastatic disease (pT4a pN1a pM1c) and received systemic chemotherapy. At follow-up (6–12 months) no evidence of recurrence was observed.

CONCLUSIONS: Incidentally discovered appendiceal neoplasms represent a heterogeneous group of rare tumors requiring individualized management. Completion right hemicolectomy should be considered in selected cases based on histological subtype, stage, and risk factors. Multidisciplinary evaluation is essential to guide optimal treatment and follow-up strategies. This case series supports a selective surgical approach and highlights the importance of careful pathological assessment after appendectomy for acute appendicitis.

Keywords: appendiceal neoplasms; appendicitis; adenocarcinoma; neuroendocrine tumors; case report; retrospective studies

Introduction

Appendiceal malignancies represent approximately 0.5% of all intestinal neoplasms and are detected in 0.9–1.7% of appendectomy specimens [1,2,3]. The vast majority of appendiceal tumors are identified incidentally during postoperative histopathological evaluation of surgical specimens obtained for presumed acute appendicitis [3,4]. Complicated appendicitis, defined by the presence of perforation and/or abscess formation, is associated with a higher risk of underlying neoplasia, with reported incidence rates ranging from 5% to 29% [4,5,6,7,8].

Despite their rarity, appendiceal tumors encompass a heterogeneous group of histopathological entities with distinct biological behavior, including neuroendocrine tumors, mucinous neoplasms, goblet cell adenocarcinomas and non-mucinous adenocarcinomas. This heterogeneity translates into significant variability in prognosis and therapeutic strategies.

In particular, the indication for completion right hemicolectomy (RHC) remains controversial and is influenced by multiple factors, including histological subtype, tumor size, depth of invasion, margin status and risk of lymph node metastasis. However, clear and universally accepted criteria for surgical decision-making are lacking, and management is often based on retrospective evidence and expert consensus.

The aim of this study is to highlight histology-specific management strategies in incidentally discovered appendiceal neoplasms and to critically discuss current indications for completion right hemicolectomy, integrating our institutional experience with a review of the available literature.

Case Presentation

We performed a retrospective case series of four patients who presented to the Department of Emergency of Ivrea

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Hospital with clinical and radiological findings suggestive of acute appendicitis and subsequently underwent emergency appendectomy. Histopathological examination of the surgical specimens revealed appendiceal neoplasms. Demographic, clinical, intraoperative, histopathological, and follow-up data were retrospectively collected from medical records and analyzed.

In addition, a systematic literature review was conducted using the PubMed database to identify studies regarding incidentally discovered appendiceal malignancies and indications for right hemicolectomy. The search included articles published between 2005 and 2025 using combinations of the following terms: "appendiceal neoplasm", "appendiceal malignancy", "low-grade appendiceal mucinous neoplasm (LAMN)", "high-grade appendiceal mucinous neoplasms (HAMN)", "appendiceal adenocarcinoma", "appendiceal neuroendocrine tumor" and "right hemicolectomy".

Relevant studies, including retrospective studies, case series, systematic reviews, consensus statements and international guidelines, were reviewed. Additional articles were identified through manual screening of the reference lists of selected studies. The selected literature was evaluated to assess pathological classification, prognostic factors and current indications for surgical management, with particular attention to the role of completion right hemicolectomy after incidental diagnosis of appendiceal neoplasms. The results of the literature review were compared with the clinical and histopathological findings of the present case series.

This case series was conducted and reported in accordance with the CARE guidelines. The completed CARE checklist is provided as **Supplementary Material**.

Results

From May 2023 to February 2026, 178 appendectomies were performed at Ivrea Hospital. Histopathological analysis identified appendiceal neoplasms in 4 cases (2.25%). Given the small sample size, single-center design, and limited study period, this finding should be interpreted as a descriptive observation rather than a representative institutional incidence. The characteristics of the four patients are reported in the table below (Table 1).

The first patient was an 18-year-old woman who presented to the Department of Emergency with abdominal pain associated with nausea and diarrhea. Laboratory tests performed in the Department of Emergency revealed leukocytosis and elevated C-reactive protein levels. An abdominal ultrasound demonstrated an appendix measuring 7 mm in diameter with thin walls and mildly hyperechoic surrounding mesenteric fat consistent with reactive changes, without evidence of fluid collections or lymphadenopathy. A diagnosis of acute appendicitis was made, and the patient subsequently underwent urgent laparoscopic appendectomy. The postoperative course was uneventful, and the patient was discharged on postoperative day three. Histopathological examination revealed a well-differentiated appendiceal neuroendocrine tumor (G1, pT1) measuring 0.6 cm in maximum diameter, with focal invasion of the muscularis propria. No lymphovascular or perineural invasion was identified. The mitotic rate was 1/10 high-power fields, and the Ki-67 proliferation index was <2%. Immunohistochemistry showed weak positivity for Chromogranin A, positivity for Synaptophysin, and positivity for cytokeratin AE1/AE3, consistent with neuroendocrine differentiation. Resection margins were negative for tumor. According to current North American Neuroendocrine Tumor Society (NANETS), European Neuroendocrine Tumor Society (ENETS) and National Comprehensive Cancer Network (NCCN) guidelines, appendectomy alone is considered adequate treatment for appendiceal neuroendocrine tumors measuring <1 cm in the absence of adverse histopathological features associated with nodal metastasis. In the present case, the tumor measured 0.6 cm, was well differentiated (G1), showed negative surgical margins, low proliferative activity (Ki-67 <2%) and no lymphovascular or perineural invasion. Furthermore, no mesoappendiceal extension or other established high-risk features were identified. Based on these findings, completion right hemicolectomy was not indicated and the patient was managed with clinical, biochemical (serum chromogranin A testing) and radiological (abdominal ultrasound) follow-up alone.

The second patient was a 59-year-old man who presented to the Department of Emergency with abdominal pain localized to the right iliac fossa. Laboratory tests revealed leukocytosis (white blood cell (WBC) 14,000/μL) and an elevated C-reactive protein level (131 mg/L; normal values are <0.5 mg/L). A contrast-enhanced abdominal computed tomography (CT) scan (Fig. 1) demonstrated an increased appendiceal diameter (approximately 18 mm) with wall thickening, hyperdensity of the perivisceral fat consistent with inflammatory changes, and several lymph nodes with reactive features. The patient subsequently underwent a laparoscopic appendectomy. Intraoperatively, the appendix appeared phlegmonous, and an inflammatory mass had formed between the cecum, the terminal ileal loop, and the abdominal wall, with several adhesions that were carefully lysed. The postoperative course was uneventful, and the patient was discharged on postoperative day four. Histopathological examination revealed a moderately differentiated (G2) non-mucinous appendiceal adenocarcinoma, classified according to WHO 2019 criteria, infiltrating the muscularis propria with focal extension into the subserosal adipose tissue (pT3). The depth of invasion beyond the muscularis propria measured 0.5 mm. No lymphovascular or perineural invasion was observed, whereas the tumor involved the surgical resection margin at the appendiceal orifice. Consequently, in view of the pT3 stage, the diagnosis of a moderately differentiated non-mucinous appendiceal adenocarcinoma and the presence of tumor involvement at the appendiceal resection margin, completion

Table 1. Clinical and pathological characteristics of the four cases.

Case	Age	Sex	Surgery	Histology	Surgical margins	Additional surgery	Final histology	Systemic chemotherapy
1	18 years	female	Laparoscopic appendectomy (17 May 2023)	NET well differentiated G1, pT1 pNx	negative	none	-	No
2	59 years	male	Laparoscopic appendectomy (27 May 2024)	Non mucinous adenocarcinoma G2, pT3 pNx	positive	Laparoscopic right hemicolectomy (08 July 2024)	pT3 pN0	No
3	44 years	male	Laparotomic appendectomy (20 February 2025)	Goblet cell adenocarcinoma G2, pT3 pNx	negative	Laparoscopic right hemicolectomy (05 May 2025)	pT3 pN0	Yes (CAPEOX, discontinued after 2 cycles due to toxicity)
4	64 years	male	Laparoscopic appendectomy and tangential cecal resection (16 June 2025)	Mucinous adenocarcinoma G2, pT4a pNx	negative	Laparoscopic right hemicolectomy (12 August 2025)	pT4a pN1a pM1c (peritoneal and omental metastases)	Yes (mFOLFOX6, 6 cycles)

NET, neuroendocrine tumor; CAPEOX, Capecitabine and Oxaliplatin; mFOLFOX6, modified folinic acid, fluorouracil, oxaliplatin regimen.

surgery with right hemicolectomy was indicated and performed approximately one and a half months after the initial operation, in accordance with oncologic principles recommending formal lymphadenectomy for accurate staging and potential therapeutic benefit. Histological examination of the surgical specimen demonstrated an adenocarcinoma moderately differentiated (residual lesion of the large bowel), infiltrating the full thickness of the bowel wall and extending 5.5 mm beyond the outer border of the muscularis propria into the pericolic subserosal adipose tissue, with an overlying tubulovillous adenoma showing low-grade epithelial dysplasia. No metastases were identified in the 18 lymph nodes examined. Necrosis was not present. A moderate peritumoral lymphoid infiltrate was observed. No invasion of extramural large-caliber venous vessels, lymphatic vessels or perineural spaces was identified. Tumor budding was low grade and the growth pattern was infiltrative. Proximal and distal surgical resection margins were free of tumor involvement. The final pathological stage, according to the TNM classification (UICC VIII edition, 2017), was therefore pT3 pN0. At oncologic evaluation, no indication for adjuvant therapy was given, and a follow-up program was established. Six months after the right hemicolectomy, the patient underwent contrast-enhanced computed tomography (CT) of the chest and abdomen, which showed no evidence of oncologic disease, and colonoscopy. During colonoscopy, a 7–8 mm pseudopedunculated rectal polyp was removed (histology: tubular adenoma with high-grade dysplasia). A follow-up colonoscopy performed five months later was unremarkable.

The third patient was a 44-year-old man who presented to the Department of Emergency with diffuse abdominal pain and constipation. Blood tests showed leukocytosis (14,000/μL) with normal C-reactive protein levels (normal values are <0.5 mg/L), and abdominal ultrasound revealed no pathological findings; the patient was therefore discharged. Three days later, he returned to the Department of Emergency due to worsening abdominal pain, now localized to the right iliac fossa, and absence of bowel movements for three days, without nausea or vomiting. Laboratory tests showed persistent neutrophilic leukocytosis, C-reactive protein of 339 mg/L. The patient subsequently underwent contrast-enhanced abdominal computed tomography (Fig. 2), which demonstrated a distended appendix (biparietal diameter approximately 15 mm) with thickened, contrast-enhancing walls and several intraluminal calcified appendicoliths. A fluid collection (approximately 11 mm in thickness) was also observed along the right paracolic gutter. The patient underwent urgent surgical appendectomy. Laparoscopic exploration of the abdominal cavity revealed diffuse peritonitis with widespread serocorpuscular fluid, marked distension of the ileal loops, and fibrin deposits; therefore, conversion to laparotomy was required. The appendix appeared gangrenous, with perforation at the tip and adhesions to the right paracolic gutter, while the cecum was swollen and congested. Postoperatively, the patient was transferred to the Intensive Care Unit due to respiratory complications (no comorbidities were reported in his medical history) and was readmitted to the General Surgery ward on postoperative day 1. On postoperative day 6 the patient was discharged. Histopathological examination of the appendix revealed a moderately differentiated goblet cell adenocarcinoma, classified according to the WHO 2019 criteria, infiltrating the subserosal layer (G2, pT3), with the

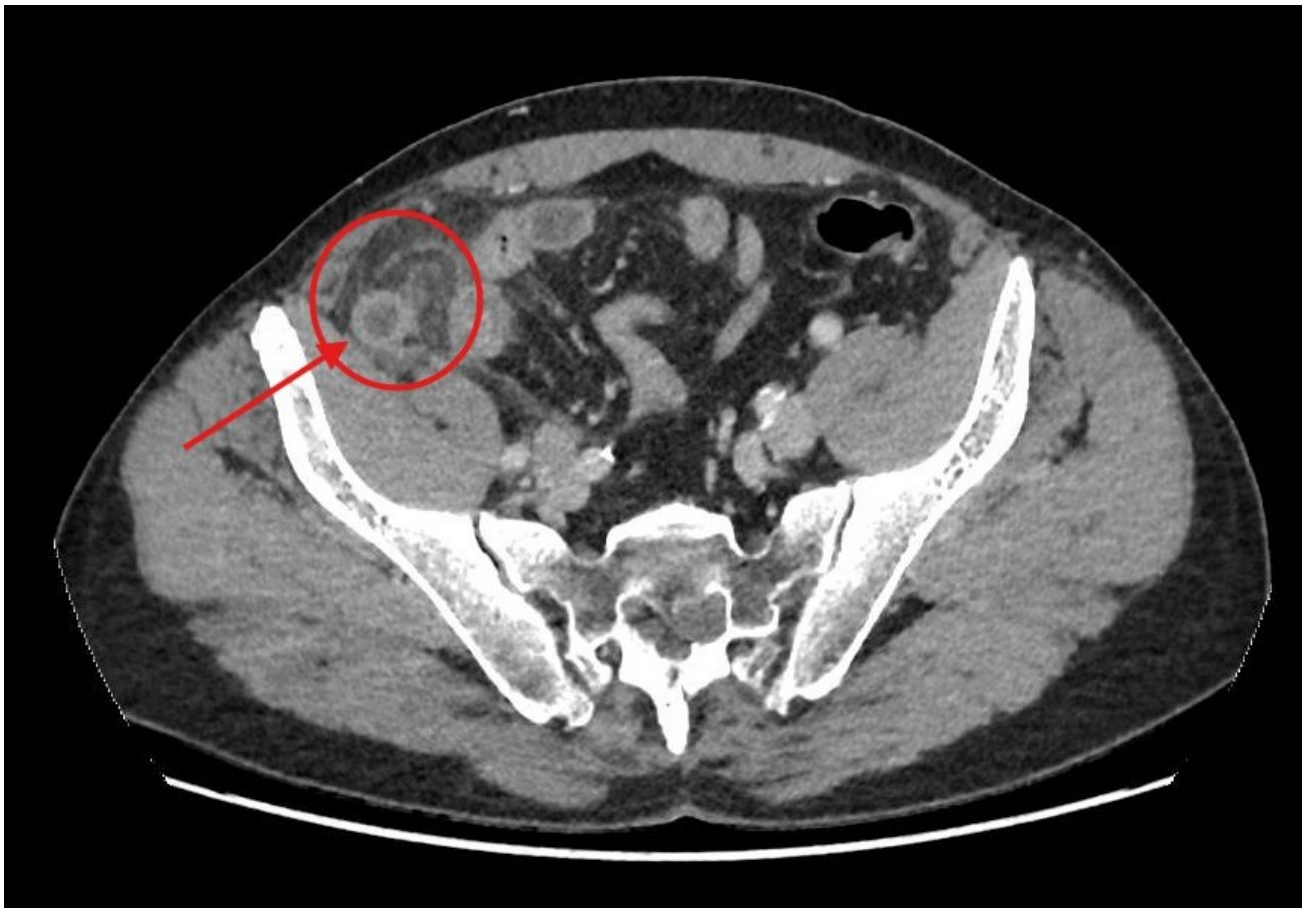

Fig. 1. Contrast-enhanced CT scan. The red arrow indicates appendiceal enlargement with wall thickening, while the red circle highlights periappendiceal inflammatory changes. CT, computed tomography.

neoplasm extending to 0.3 mm from the visceral serosal surface. Surgical resection margins were negative for tumor involvement. No lymphovascular invasion was identified, whereas perineural invasion was present. Based on these findings and considering the diagnosis of a goblet cell adenocarcinoma (a histological subtype characterized by aggressive biological behavior and frequent underestimation of disease extent), completion surgery with right hemicolectomy was indicated and performed two months after the initial operation in accordance with oncologic principles requiring formal lymphadenectomy for accurate staging and potential therapeutic benefit. Histopathological analysis of the surgical specimen showed no evidence of residual neoplasia and no metastatic lymph nodes (13 examined); surgical resection margins were negative. The final staging, according to the TNM classification (UICC VIII edition, 2017), was therefore pT3 pN0. During oncological evaluation, adjuvant chemotherapy with Capecitabine and Oxaliplatin (CAPEOX) for four cycles was recommended due to the known aggressive biological behavior of goblet cell adenocarcinoma and the risk of occult micrometastatic disease despite node-negative disease; however, treatment was discontinued after two cycles due to gastrointestinal toxicity. Instrumental follow-up with contrast-enhanced CT of the chest and abdomen and colonoscopy has been performed regularly, with no evidence of disease recurrence.

The fourth patient was a 64-year-old man who presented to the Department of Emergency with abdominal pain in the right abdominal quadrants. His past medical history was notable for seminoma treated with orchiectomy and radiotherapy 20 years earlier and endoscopic cecal polypectomy (histology: moderate dysplasia) performed five years prior. The patient underwent blood tests, which revealed C-reactive protein of 82 mg/L (normal values are <0.5 mg/L) and abdominal ultrasound, which demonstrated a small right perirenal fluid collection; he was therefore discharged. The patient continued to experience persistent abdominal pain and re-presented to the Department of Emergency four months later. Laboratory tests showed leukocytosis (WBC 12,000/μL) and C-reactive protein of 171 mg/L. Contrast-enhanced abdominal CT (Fig. 3) confirmed the presence of an abscess collection in the right iliac fossa, likely originating from the appendix. A suspected fistulous tract was reported between the cranial portion of the appendix and the ascending colon. The iliopsoas muscle appeared mildly thickened, likely due to inflammatory extension by contiguity. The patient underwent urgent surgery. Exploration of the peritoneal cavity revealed peritoneal hyperemia in the

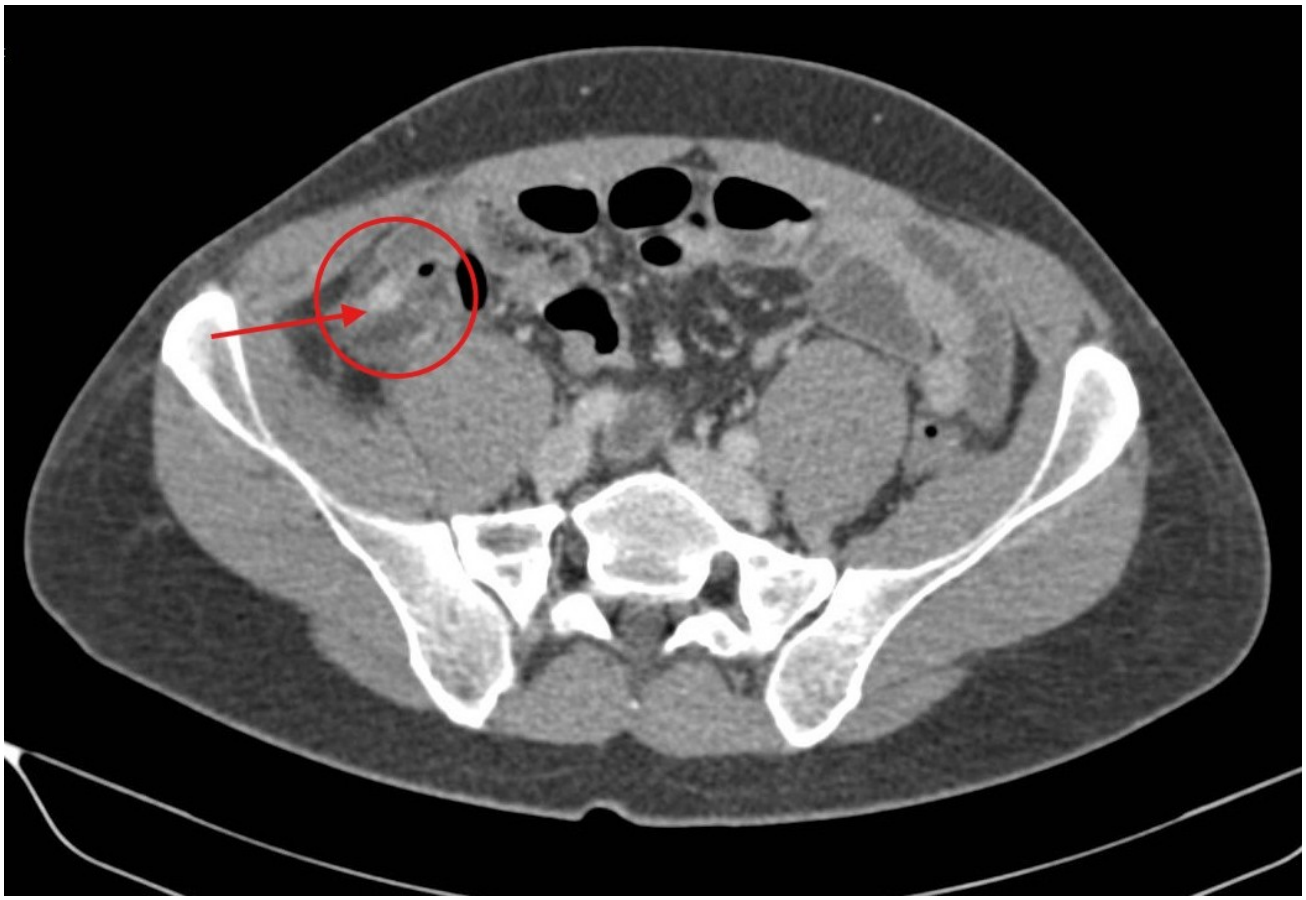

Fig. 2. Contrast-enhanced CT scan. The red arrow indicates appendiceal distension with wall thickening and appendicoliths, while the red circle highlights associated periappendiceal fluid collection.

right iliac fossa, an appendix with markedly increased consistency (including at the base), and a retroperitoneal paracolic abscess extending toward the abdominal wall. The abscess was drained, and appendectomy with tangential resection of the cecal wall was performed. The postoperative course was uneventful, and the patient was discharged on postoperative day 4. Histopathological examination of the surgical specimen revealed a perforated appendix harboring a moderately differentiated mucinous adenocarcinoma (G2), classified according to the WHO 2019 criteria, with tumor infiltration extending through the appendiceal wall to the visceral serosal layer (pT4). Fragments of fibromuscular and adipose connective tissue infiltrated by mucinous adenocarcinoma were also identified. No lymphovascular invasion was observed, whereas focal perineural invasion was present. The surgical resection margin was free of neoplastic infiltration. Based on the histopathological findings, completion surgery was recommended after staging with colonoscopy and contrast-enhanced CT of the chest and abdomen. During colonoscopy (performed two months after surgery), a sessile cecal polyp was removed (histology: adenoma with low-grade epithelial dysplasia), and a 5-cm lesion suspicious for neoplasia in the ascending colon was biopsied (histology: ulcerated fragments of mucinous adenocarcinoma). The CT scan was oncologically negative; therefore, the patient underwent laparoscopic right hemicolectomy two months after the first operation. During surgery, several peritoneal nodules suspicious for carcinomatosis were excised, located in the perileal region, the hepato-diaphragmatic interspace, the omentum, the Gerota fascia, and the right paracolic gutter. Histopathological examination revealed multiple subserosal nodules of adenocarcinoma in the right colon, the largest infiltrating the colonic wall through its full thickness with ulceration of the overlying mucosa, and one metastatic lymph node out of 16 examined. Multiple nodules of mucinous adenocarcinoma were also found in the omentum (the largest lesion measuring 0.5 cm in maximum diameter), and fragments of fibromuscular connective tissue with a maximum diameter ranging between 0.2 and 1 cm infiltrated by mucinous adenocarcinoma were identified in the peritoneum. Focal perineural invasion was present, whereas surgical resection margins were negative for tumor involvement. The final pathological staging, according to the TNM classification (UICC VIII edition, 2017), was pT4a pN1a pM1c; this finding confirms the known limitations of cross-sectional imaging in detecting early peritoneal dissemination in mucinous appendiceal neoplasms, where disease burden may

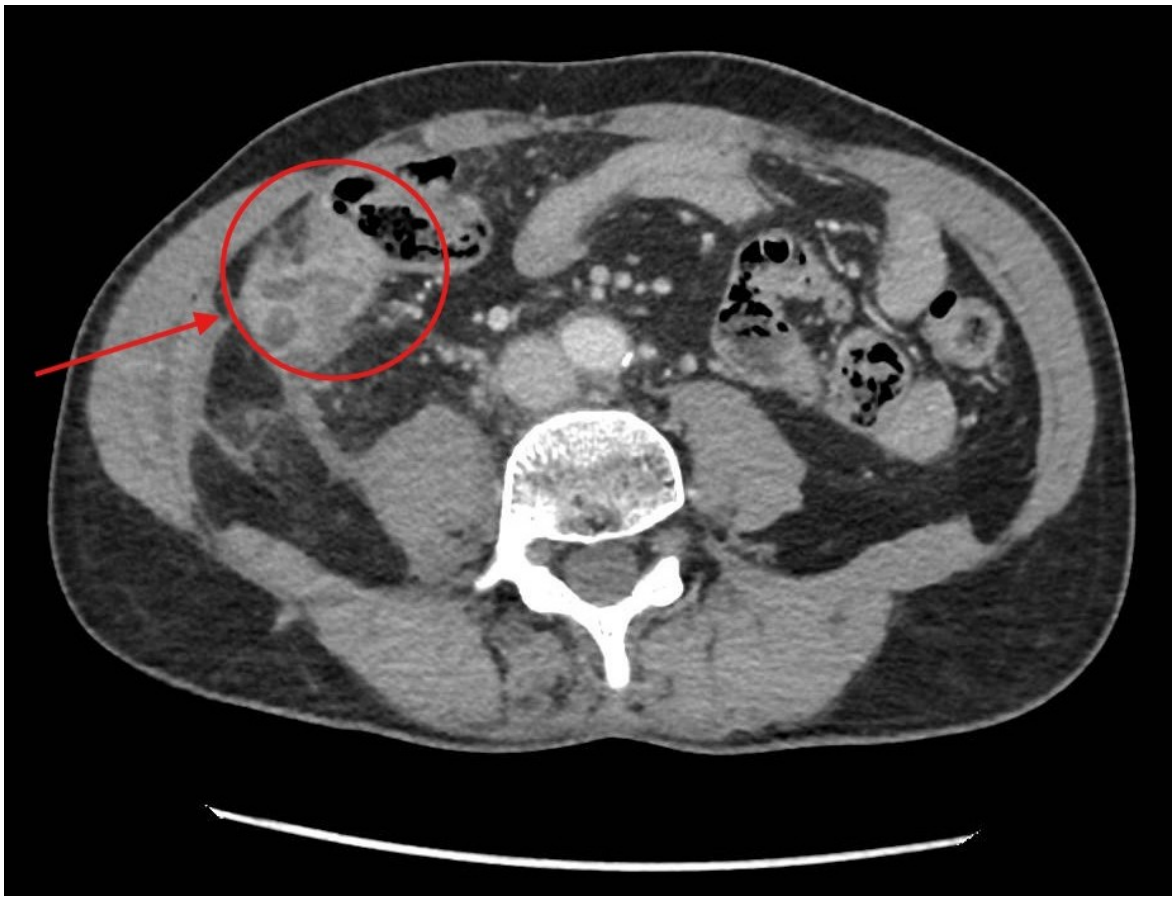

Fig. 3. Contrast-enhanced CT scan. The red arrow and the red circle indicate a right iliac fossa abscess with suspected appendiceal origin.

be underestimated despite negative preoperative staging. Given the presence of peritoneal dissemination and nodal involvement (pN1a pM1c), systemic chemotherapy with the mFOLFOX6 regimen for six cycles was recommended in line with colorectal cancer–based treatment strategies for advanced appendiceal adenocarcinoma. Six months after surgery, following completion of six cycles of modified folinic acid, fluorouracil, oxaliplatin regimen (mFOLFOX6), a total-body restaging CT showed no evidence of disease.

Discussion

Although relatively rare, the incidence of reported appendiceal neoplasms, approximately 1–2%, has been increasing globally.

According to the 5th edition of the WHO Classification of Digestive System Tumours (2019), appendiceal neoplasms are categorized into four main histopathological subgroups: neuroendocrine tumors (NETs), mucinous neoplasms, goblet cell adenocarcinomas (GCAs) and non-mucinous adenocarcinomas [3,9,10]. Mucinous neoplasms are further subdivided based on cytological grade and the presence or absence of infiltrative invasion into low-grade appendiceal mucinous neoplasms (LAMNs), high-grade appendiceal mucinous neoplasms (HAMNs) and mucinous adenocarcinomas [3,9,10]. Non-mucinous adenocarcinomas are further subdivided into colonic-type (intestinal-type) adenocarcinoma and signet ring cell adenocarcinoma. Goblet cell adenocarcinoma represents a distinct histopathological entity characterized by mixed neuroendocrine and adenocarcinomatous features and is classified separately from both mucinous and non-mucinous adenocarcinomas [3,9,10].

Mucinous epithelial neoplasms represent the largest group, accounting for approximately 40–60% of appendiceal tumors. Clear epidemiological data regarding the relative incidence of mucinous adenocarcinoma, LAMNs and HAMNs are not available in the literature, mainly due to the rarity of these entities, the limited number of large population-based studies, and the frequent aggregation of these subtypes in reported series. Neuroendocrine tumors account for approximately 15–25%, while non-mucinous adenocarcinomas represent approximately 10–20% of cases. Goblet cell adenocarcinoma is a distinct histopathological entity, reported in approximately 5–15% of appendiceal neoplasms, although its reported frequency varies across series due to differences in classification systems and case selection [8].

In the present series, this histopathological spectrum was fully represented across the four cases, including a well-differentiated NET (Case 1), a non-mucinous adenocarcinoma (Case 2), a goblet cell adenocarcinoma (Case 3) and an advanced mucinous adenocarcinoma with peritoneal dissemination (Case 4).

Prognosis varies widely according to histology and stage. Low-grade neuroendocrine tumors have the best prognosis. Five-year overall survival rates are 63%–75% for well- and moderately differentiated mucinous tumors, and 60%–70% for non-mucinous tumors [8,11].

This marked heterogeneity in biological behavior was directly reflected in the therapeutic pathways adopted in the present series, ranging from appendectomy alone to multimodal oncologic treatment including right hemicolectomy, cytoreduction and systemic chemotherapy.

Following the incidental histopathological diagnosis of an appendiceal tumor, careful planning of follow-up and consideration of the indications for right hemicolectomy (RHC) are crucial [3].

For non-metastatic NETs confined to the appendix, treatment is generally guided by tumor size and histopathological features [10,12,13,14,15,16]. Tumors >2 cm typically warrant RHC due to nodal metastases in up to 40% of patients. Management of NETs measuring 1–2 cm remains controversial. Current North American Neuroendocrine Tumor Society (NANETS) and European Neuroendocrine Tumor Society (ENETS) guidelines recommend appendectomy alone for tumors <1 cm and for 1–2 cm lesions without adverse histopathological features, while the National Comprehensive Cancer Network (NCCN) guidelines recommend appendectomy alone for all tumors <2 cm, even with high-risk features, although several studies have demonstrated an increased risk of nodal involvement in tumors ≥1.5 cm [12,17,18,19]. Features that are considered associated with nodal invasion include tumor location at the base of the appendix, grade G2, mesoappendiceal or lymphovascular invasion, mitotic index >2 per high-power field and Ki-67 >3%. Nevertheless, large database analyses have not shown a significant survival benefit of RHC compared with appendectomy alone for tumors <2 cm, even in the presence of high-risk pathological features [20]. This management strategy was applied in Case 1, in which no high-risk features were identified and appendectomy alone was considered definitive treatment.

Patients with LAMNs with negative margins and no evidence of perforation or peritoneal involvement can be safely managed with appendectomy alone. Management of HAMNs is more controversial, with some authors advocating RHC. LAMNs and HAMNs generally behave as expansile lesions that dissect through the appendiceal wall without lymphatic or vascular invasion. Previous studies demonstrate that, in cases of RHC performed for non-disseminated LAMNs and HAMNs, no metastatic lymph nodes were identified, suggesting that routine lymphadenectomy may not confer additional oncologic benefit [12,13,14,15,16]. For HAMNs with histologic perforation or peritoneal disease, RHC combined with cytoreductive surgery (CRS) and hyperthermic intraperitoneal chemotherapy (HIPEC) may be considered [10,12,14,15,16].

In contrast, appendiceal adenocarcinomas carry a higher risk of nodal metastases (20%–67%), particularly in non-mucinous subtypes [3,12,13,14]. Consequently, most patients with adenocarcinoma confined to the appendix should undergo oncologic RHC with adequate lymphadenectomy for staging and potential therapeutic benefit, which also guides the need for adjuvant systemic chemotherapy. This recommendation also applies to GCAs or tumors with mixed neuroendocrine and adenocarcinoma features [3,12,13,14]. This approach was reflected in Case 2, where the presence of a pT3 G2 non-mucinous adenocarcinoma with positive margin after appendectomy represented an indication for completion right hemicolectomy, in accordance with current oncologic principles. Similarly, Case 3 illustrates the aggressive biological potential of goblet cell adenocarcinoma, which justified completion right hemicolectomy and adjuvant chemotherapy despite the absence of lymph node metastases.

For high-grade or metastatic disease, a multimodal approach including systemic chemotherapy, similar to protocols for metastatic colorectal cancer, is recommended. Patients with stage III appendiceal adenocarcinoma or stage II disease with high-risk features (inadequate lymph node yield, perforation, signet-ring cells, poor differentiation or non-mucinous histology) should receive adjuvant chemotherapy post-resection [8,11,12]. Regimens typically include 5-fluorouracil with oxaliplatin and/or irinotecan, sometimes combined with bevacizumab, for a duration of 3–6 months, aiming for 6 months when tolerated. Stage I and low-risk stage II adenocarcinomas can be monitored after surgery. Routine systemic chemotherapy is not recommended for LAMNs or well-differentiated mucinous adenocarcinomas without peritoneal spread [8,11,12,14]. Case 4 represents the extreme end of the disease spectrum, where mucinous adenocarcinoma associated with perforation, abscess formation and peritoneal dissemination required an extended surgical approach including right hemicolectomy and subsequent systemic chemotherapy.

Postoperative surveillance should be structured for patients with high-grade tumors, those undergoing RHC for locally advanced or perforated tumors, or those with lymphatic or peritoneal involvement. Recommended follow-up includes periodic clinical evaluation, serial serum tumor markers (carcinoembryonic antigen (CEA), CA-125, CA19-9), and CT or magnetic resonance imaging (MRI) of the chest, abdomen and pelvis every 6–12 months during the first 2–4 years [12,14]. Routine fluorodeoxyglucose positron emission tomography/computed tomography (FDG-PET/CT) is not recommended. Colonoscopy is warranted, given the in-

creased risk of synchronous colonic lesions in patients with appendiceal neoplasms [8,12,14].

The diagnostic course observed in Cases 3 and 4 of the present series highlights that appendiceal neoplasms may initially present as acute or recurrent inflammatory conditions, which can lead to delayed or incidental diagnosis, particularly when the clinical and radiological findings are indistinguishable from uncomplicated appendicitis. In these cases, disease progression with perforation, abscess formation or imaging features suggestive of fistulization ultimately revealed an underlying malignant process.

These observations suggest that certain clinical and radiological features should raise suspicion for an occult appendiceal neoplasm, particularly in older patients or in the presence of persistent or recurrent symptoms, appendiceal abscess, atypical or prolonged inflammatory evolution, unexplained weight loss or failure to respond to initial treatment. In such scenarios, early cross-sectional imaging with contrast-enhanced CT and colonoscopic evaluation may facilitate earlier diagnosis and staging. A high index of suspicion is therefore essential to avoid delayed diagnosis and to ensure timely oncologic management in selected patients with complicated appendicitis. Importantly, these findings also raise the unresolved question of whether a subset of patients with high-risk clinical and radiological features may benefit from an upfront oncologic surgical strategy, including primary right hemicolectomy, rather than a staged approach following initial appendectomy. Further prospective and multicenter studies are warranted to better define predictive factors for underlying malignancy and to clarify the optimal timing and extent of surgical resection in this setting.

Limitations

Several limitations should be considered when interpreting the results of this study. Its retrospective, single-center design and the relatively small sample size reflect the rarity of these conditions in clinical practice. In addition, the heterogeneity of tumor histotypes and the limited follow-up period may have partially influenced the assessment of outcomes. Finally, the absence of a systematic review methodology should be taken into account when contextualizing the findings.

Conclusions

Appendiceal neoplasms represent a heterogeneous group of rare tumors that are most often diagnosed incidentally after appendectomy for presumed acute appendicitis. Their management should not be considered uniform, as therapeutic strategies vary according to histological subtype, tumor stage, resection margin status and the presence of established high-risk features. Completion right hemicolectomy should therefore be selectively indicated based on these pathological and clinical determinants, rather than applied routinely. RHC is recommended for non-mucinous appendiceal adenocarcinoma with transmural or subserosal invasion, goblet cell adenocarcinoma, positive or uncertain resection margins or tumors with high-risk histological features associated with an increased risk of nodal involvement, whereas appendectomy alone is adequate for low-grade neuroendocrine tumors <1 cm and low-risk LAMNs without perforation or extra-appendiceal spread. Importantly, persistent, recurrent or complicated appendicitis should prompt consideration of an underlying neoplastic process, particularly in older patients or in the presence of atypical clinical evolution. These findings underscore the need for a structured, risk-adapted approach integrating surgical pathology and clinical presentation to optimize patient management.

Availability of Data and Materials

The data are not publicly available because they contain sensitive clinical information related to individual patients. However, anonymized data may be available from the corresponding author upon reasonable request, in compliance with patient privacy regulations.

Author Contributions

LD, CB, SP, IL, SZ, MB, LB, GM, LCP, AB, and LPS contributed equally to the conception of the study, data collection, and literature review. LPS supervised the entire research process. MB, IL, LB and GM primarily contributed to the surgical management of the patients. CB, LCP and SZ were responsible for manuscript editing. SP and AB supervised the follow-up section. LD drafted the manuscript as the first author. All authors have been involved in revising the manuscript critically for important intellectual content. All authors gave final approval of the version to be published. All authors have participated sufficiently in the work to take public responsibility for appropriate portions of the content and agreed to be accountable for all aspects of the work in ensuring that questions related to its accuracy or integrity.

Ethics Approval and Consent to Participate

This study is a retrospective case series of four patients combined with a literature review. No prospective interventions or modifications to standard clinical management were performed. According to the local institutional policies, formal Ethics Committee approval was not required for this type of study, as all data were collected retrospectively from routine clinical practice and were fully anonymized. Nevertheless, the study was conducted in accordance with institutional guidelines and the principles of the Declaration of Helsinki. Written informed consent was obtained from all patients for surgical treatment and for the use of anonymized clinical data for research purposes.

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Conflict of Interest

The authors declare no conflict of interest.

Supplementary Material

Supplementary material associated with this article can be found, in the online version, at https://doi.org/10.62713/aic.4703.

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