

EXTRA-UTERINE OSSEOUS METAPLASIA, OVARIAN FIBROMA, AND A GASTRIC GIST: AN UNPRECEDENTED COLLISION OF PATHOLOGIES

Gynaecology

Dr. Rahul Manchanda	Head of department, Gynae Endoscopy, Pushpawati Singhanian Research Institute, New Delhi
Dr. Yash Bahuguna*	1Attending Consultant, Gynae Endoscopy, Pushpawati Singhanian Research Institute, New Delhi*Corresponding Author
Dr. Anju Gupta	Head of Department, Laboratory Medicine, Pushpawati Singhanian Research Institute, New Delhi

ABSTRACT

Osseous metaplasia of the round ligament is an exceedingly rare phenomenon, typically associated with chronic inflammation, trauma, or endometriosis. Its concurrent presentation with an ovarian fibroma—a benign sex cord-stromal tumor—and a gastrointestinal stromal tumor (GIST) presents a highly unusual and complex diagnostic challenge. We report the case of a 38-year-old female who presented with intermittent pain in abdomen for several months. Pre-operative imaging revealed a large, lobulated solid mass measuring 6.9×4.0 cm located in the left adnexa. Additionally, imaging identified a separate 4.0×4.0 cm solid lesion situated on the posterior wall of the stomach near the greater curvature, raising the clinical suspicion of a primary gastrointestinal malignancy with disseminated peritoneal or ovarian metastasis. During surgical intervention, three morphologically distinct pathologies were identified: a 4×4 cm GIST located in the posterior wall of the stomach between the distal fundus and proximal body of the stomach, a 9×6 cm ovarian fibroma, and a firm, nodular lesion on the round ligament. Exhaustive histopathological and immunohistochemical evaluation confirmed the independent, non-metastatic nature of all three lesions, notably identifying true mature bone formation in the round ligament indicative of osseous metaplasia. To our knowledge, this is the first reported case documenting the simultaneous occurrence of an intra-abdominal GIST, an ovarian fibroma, and osseous metaplasia of the round ligament. This case highlights a critical diagnostic pitfall, emphasizing the necessity of thorough histopathological and immunohistochemical workups in multi-focal abdominal masses to avoid misdiagnosing a rare "collision" of independent localized pathologies as disseminated metastatic disease.

KEYWORDS

INTRODUCTION

Gastrointestinal stromal tumors (GISTs) are the most common mesenchymal neoplasms of the digestive tract. They primarily originate from the interstitial cells of Cajal, the pacemaker cells of the gastrointestinal system, and are most often driven by activating mutations in the KIT or PDGFRA genes [1]. While GISTs possess a well-documented metastatic potential—most frequently spreading to the liver and peritoneum—extra-gastrointestinal metastases to the ovaries or uterine ligaments are extraordinarily rare. Consequently, the discovery of a GIST alongside concurrent pelvic masses frequently presents a clinical conundrum, often mimicking advanced, disseminated disease.

Ovarian fibromas are benign sex cord-stromal tumors that account for approximately 2% to 5% of all ovarian neoplasms [2]. While generally asymptomatic and solitary, they can occasionally present with pelvic pain, mechanical compression, or in association with ascites and pleural effusion, a condition known as Meigs syndrome [2]. Though dystrophic calcification may occasionally occur within these tumors, true osteogenesis or association with extra-ovarian bone formation is highly atypical unless linked to a broader genetic condition, such as Gorlin syndrome.

Heterotopic bone formation within the female reproductive tract is an uncommon pathological finding that most frequently involves the endometrium as a rare cause of secondary infertility [3]. Osseous metaplasia occurring specifically within the round ligament is exceptionally rare. It is hypothesized to result from the differentiation of multipotent mesenchymal cells into osteoblasts, a process usually provoked by chronic tissue inflammation, prior surgical trauma, mechanical friction, or underlying endometriosis.

The simultaneous presentation of a GIST, an ovarian fibroma, and osseous metaplasia of the round ligament has not been previously described in the medical literature. Clinically and radiologically, this triad of distinct mesenchymal and stromal pathologies strongly mimics a primary gastrointestinal malignancy with extensive peritoneal carcinomatosis or Krukenberg tumors. We present this novel case to document a rare "collision" of independent pathologies and to underscore the paramount importance of definitive histopathological and immunohistochemical evaluation in preventing the oncological overtreatment of concurrent benign and localized neoplastic processes.

Case Presentation

A 38-year-old female presented to the hospital with a chief complaint of intermittent abdominal pain that had been occurring on and off for several months. She had no significant past medical, surgical, or family history of gynecological or gastrointestinal malignancies. While her general physical examination was largely unremarkable, deep palpation of the lower abdomen revealed a palpable pelvic mass corresponding to the size of a 12-week gravid uterus.

Routine laboratory investigations, including a complete blood count, biochemical profile, and standard serum tumor markers (such as CA-125 and CEA), were within normal limits. As part of the diagnostic workup for her abdominal pain, an upper gastrointestinal endoscopy was performed. The endoscopy revealed a large subepithelial polypoidal lesion with a superficial ulcer located in the proximal body of the stomach along the greater curvature (Figure 1). The overlying mucosa appeared normal, raising a strong clinical suspicion for a gastrointestinal stromal tumor (GIST). Following this, a Computed Tomography (CT) scan of the abdomen and pelvis was conducted, which visualized this 4.0×4.0 cm solid gastric lesion and additionally revealed a large, lobulated solid mass measuring 6.9×4.0 cm located in the left adnexa (Figure 2). Given these multifocal findings, there was a preoperative clinical suspicion of a primary gastrointestinal neoplasm with a synchronous ovarian metastasis (Krukenberg tumor) or independent primary tumors.

The patient initially underwent a diagnostic and therapeutic laparoscopy. Intraoperatively, the surgical team confirmed a solid, lobulated mass replacing the left ovary. During the systematic laparoscopic exploration of the pelvic cavity, an abnormal, firm, nodular lesion was incidentally discovered on the right round ligament. The left ovarian mass and the incidental right round ligament lesion were excised laparoscopically. Following their removal, the procedure was converted to an exploratory laparotomy to safely and adequately address the gastric tumor. A wedge resection of the stomach was performed to completely excise the 4.0×4.0 cm solid mass on the posterior wall.

Extensive histopathological and immunohistochemical (IHC) analyses were performed on the excised specimens (Table 1). Notably, histological examination of the circumscribed nodular tissue from the abdominal wall near the entry of the right round ligament displayed focal hyaline cartilage with endochondral ossification surrounded by

fibrous and adipose tissue (Figure 1, Figure 2). There was no evidence of significant cytological atypia or mitotic activity. These features were suggestive of osseous metaplasia.

Table 1: Histopathological and Immunohistochemical Findings

Specimen	Microscopic Features	Diagnosis / Impression
Ovarian Mass	Cellular tumor comprising intersecting fascicles of cells with bland spindled to ovoid nuclei and scanty eosinophilic cytoplasm embedded within a collagenous stroma with the formation of hyalinized plaque. Focal areas of myxoid change were noted. There was no evidence of significant nuclear atypia, mitotic activity, or necrosis, and the fallopian tube was unremarkable histologically. (Figure 1)	Ovarian fibroma
Round Ligament	Circumscribed nodular tissue from the abdominal wall near the entry of the right round ligament displayed focal hyaline cartilage with endochondral ossification surrounded by fibrous and adipose tissue. There was no evidence of significant cytological atypia or mitotic activity. (Figure 2)	Osseous metaplasia
Gastric Mass	Tumor classified as pT2 with a moderate risk assessment. A comprehensive IHC panel confirmed the diagnosis, showing diffuse immunoreactivity for CD117, DOG-1, and CD34 in the tumor cells. The tumor was negative for SMA, S-100, h-Caldesmon, Desmin, and Pan CK. The Ki67 proliferation index was 10-12%.	Grade 2 (High grade) Gastrointestinal stromal tumor (GIST)

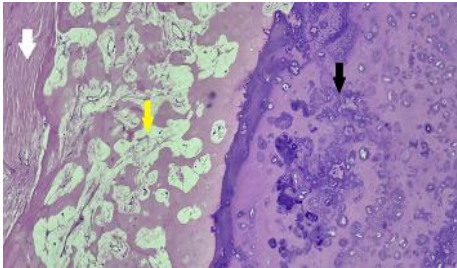


Figure 1: Microscopic examination of the round ligament nodule (H&E stain, 100x). The black arrow indicates an area of hyaline cartilage undergoing endochondral ossification. The white arrow points to the resulting mature, eosinophilic trabecular bone containing osteocytes within lacunae. The yellow arrow highlights the intertrabecular spaces containing fibrofatty tissue, confirming true osseous metaplasia.

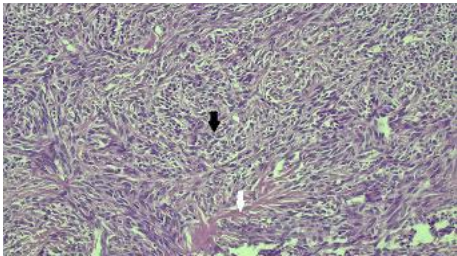


Figure 2: Microscopic examination of the left ovarian mass (H&E stain, 200x). The black arrow points to intersecting fascicles of uniform spindle cells with bland, ovoid nuclei. The white arrow indicates the background of dense, eosinophilic collagenous stroma characteristic of a benign ovarian fibroma.

The patient had an uncomplicated postoperative recovery and was discharged. At follow-up, she remained asymptomatic with no clinical or radiological evidence of disease recurrence.

DISCUSSION

The concurrent presentation of an intra-abdominal gastrointestinal stromal tumor (GIST), a benign ovarian fibroma, and osseous metaplasia of the round ligament is exceedingly rare. This triad presents a profound diagnostic challenge due to the overlapping clinical and radiological features, which strongly mimic disseminated malignancy, such as a primary gastrointestinal tumor with Krukenberg metastases or peritoneal carcinomatosis.

GISTs are mesenchymal tumors that can arise anywhere along the gastrointestinal tract, though extra-gastrointestinal metastases to the female reproductive organs are highly unusual. When a patient presents with a primary gastrointestinal mass and concurrent adnexal masses, the leading differential diagnosis is frequently a Krukenberg tumor—a metastatic signet ring cell carcinoma most commonly originating from the stomach or colon [4]. Indeed, GIST metastasis to the ovary is exceptionally rare, with only a few cases reported in the literature [5]. This diagnostic presumption often leads to the assumption of stage IV disease, potentially resulting in inappropriate palliative management rather than curative surgical resection. In our case, the distinct separation of the ovarian and ligamentous masses from the primary GIST, combined with precise immunohistochemical differentiation, was vital to establishing that these were independent, localized pathologies.

Ovarian fibromas, while benign, can occasionally present as solid, complex adnexal masses that mimic malignancy on cross-sectional imaging. They are frequently misdiagnosed preoperatively as malignant disease, particularly when associated with ascites [6]. The identification of a distinct ovarian fibroma alongside a GIST represents a rare "collision" of separate mesenchymal and sex cord-stromal neoplasms. Ovarian collision tumors, such as the coexistence of an ovarian fibroma with a serous cystadenoma, have been well documented in the literature, emphasizing the absolute need for robust histological assessments to prevent misdiagnosis [7,8,9]. Because these two tumors do not share a well-defined syndromic link—unlike the association of GISTs with Carney triad or ovarian fibromas with Gorlin syndrome—their simultaneous occurrence in this patient is considered coincidental rather than syndromic.

The finding of osseous metaplasia within the round ligament adds a unique layer of complexity to this case. Heterotopic ossification in the female reproductive tract is uncommon and most frequently observed as endometrial osseous metaplasia [10]. The pathogenesis of osseous metaplasia outside the endometrium remains poorly understood, but the prevailing hypothesis suggests that chronic inflammation, mechanical friction, or previous tissue trauma triggers the differentiation of multipotent mesenchymal fibroblasts into bone-forming osteoblasts [10]. In the present case, it is plausible that chronic mechanical irritation or local inflammatory responses provoked by the adjacent ovarian fibroma and the bulky pelvic mass created an environment conducive to osteoblastic differentiation within the round ligament. Crucially, histological examination was required to differentiate true mature bone formation (metaplasia) from the dystrophic calcification that can occasionally occur in degenerating benign fibromas.

CONCLUSION

To our knowledge, this is the first reported case of an incidental GIST presenting concurrently with an ovarian fibroma and osseous metaplasia of the round ligament. This unprecedented combination of pathologies serves as a critical reminder of the limitations of clinical and radiological diagnoses in the setting of multifocal abdominal masses. While the presence of a gastrointestinal tumor alongside complex pelvic masses strongly suggests metastatic disease, clinicians must maintain a high index of suspicion for the rare occurrence of independent "collision" tumors. Definitive histopathological and immunohistochemical evaluations are paramount to distinguish

between disseminated malignancy and concurrent benign or localized disease, ultimately safeguarding patients from inappropriate oncological overtreatment.

REFERENCES

1. Khan, J., Ullah, A., Waheed, A., et al. (2022). Gastrointestinal Stromal Tumors (GIST): A Population-Based Study Using the SEER Database, including Management and Recent Advances in Targeted Therapy. *Cancers*, 14(15), 3689. <https://doi.org/10.3390/cancers14153689>
2. Upreti, D., Rohita, D. K., Yadav, S. K., & Thapa, N. (2022). Case Report: Ovarian fibroma: typical presentation with Meigs's Syndrome. *F1000Research*, 11, 815. <https://doi.org/10.12688/f1000research.122368.1>
3. Bahceci, M., & Demirel, L. C. (1996). Case report: Osseous metaplasia of the endometrium: a rare cause of infertility and its hysteroscopic management. *Human Reproduction*, 11(11), 2537–2539. <https://doi.org/10.1093/oxfordjournals.humrep.a019154>
4. Gupta, S., Ahuja, S., & Kalwaniya, D. S. (2024). Immunohistochemistry Markers in Ovarian and Fallopian Tube Neoplasms: a Comprehensive Review. *Indian Journal of Surgical Oncology*, 15, 465–480. <https://doi.org/10.1007/s13193-024-02049-y>
5. Yamaguchi, T., Kinoshita, J., et al. (2021). Gastrointestinal stromal tumor metastasis to the ovary: A case report. *SAGE Open Medical Case Reports*, 9, 2050313X211012511. <https://doi.org/10.1177/2050313X211012511>
6. Selak, N. (2023). Extraovarian fibrothecomas: Two case reports and comprehensive review of the literature. *Case Reports in Women's Health*, 40, e00554. <https://doi.org/10.1016/j.crwh.2023.e00554>
7. Mongelli, M., Silvestris, E., Loizzi, V., Cormio, G., & Arezzo, F. (2022). A Rare Case of Collision Tumours of the Ovary: An Ovarian Serous Cystadenoma Coexisting with Fibrothecoma. *Diagnostics*, 12(11), 2840. <https://doi.org/10.3390/diagnostics12112840>
8. Rjoop, A., Obiedat, R., Al-Oqaily, A., Abu Baker, S., & Matalaka, I. (2024). Ovarian collision tumour consisting of a fibroma and a serous cystadenoma: A case report. *Case Reports in Women's Health*, 42, e00602. <https://doi.org/10.1016/j.crwh.2024.e00602>
9. Shopov, S. (2019). A Collision between Fibroma and Serous Ovarian Cystadenoma Mimicking Carcinoma. *Folia Medica*, 61(4), 634–638. <https://doi.org/10.3897/folmed.61.e47956>
10. Devdhar, S., Gupta, V., Gautam, R., & Chaudhary, A. (2024). Osseous Metaplasia of the Endometrium: A Rare Pathological Entity. *Cureus*, 16(6), e62204. <https://doi.org/10.7759/cureus.62204>