



## UNUSUAL ELEVATION OF CA-125 IN RUPTURED ENDOMETRIOMA: A CASE REPORT.

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**ABSTRACT** CA-125, a high molecular weight glycoprotein, has an important role in differentiating benign from malignant pelvic masses. A markedly elevated CA-125, usually indicates epithelial ovarian cancer. We present a case of ruptured endometrioma with unusually high CA-125 levels which responded to surgical management. An endometrioma needs to be kept as a differential diagnosis even in very high levels of CA-125.

**KEYWORDS :** Ruptured endometrioma, hemoperitoneum, CA-125

## INTRODUCTION

CA-125 (Cancer Antigen-125) is a high-molecular-weight glycoprotein primarily associated with epithelial ovarian carcinoma and serves as a crucial tumor marker in clinical practice. However, its specificity is limited due to its elevation in numerous benign conditions. Among benign pathologies, pelvic inflammatory disease (PID), uterine fibroids, endometriosis, and endometriomas are well-documented causes of increased serum CA-125 levels.<sup>(1,2,3)</sup> This diagnostic overlap necessitates careful clinical correlation to avoid misinterpretation, particularly in women of reproductive age.

Endometriomas, colloquially termed "chocolate cysts," are cystic lesions of the ovary lined by ectopic endometrial tissue and filled with degenerated blood products. These cysts are a hallmark of endometriosis, a condition where endometrial-like tissue grows outside the uterine cavity. While endometriomas are typically benign, they can lead to significant morbidity, including chronic pelvic pain, infertility, and, in rare cases, acute complications such as rupture and hemoperitoneum.<sup>(4,5)</sup>

When an endometrioma ruptures, its contents—rich in CA-125, inflammatory cytokines, and hemosiderin-laden macrophages—are released into the peritoneal cavity. This spillage incites a robust inflammatory response, leading to acute abdominal pain (acute abdomen) and in some cases; peritonitis. Additionally, the sudden release of CA-125 into the circulation can cause a marked elevation in serum levels, occasionally reaching extremely high values (>9000 IU/mL).<sup>(5,6)</sup> Such extreme elevations are rare but can mimic malignant conditions like advanced ovarian cancer, posing a significant diagnostic dilemma.

The conventional upper limit for serum CA-125 is 35 IU/mL, with levels above this threshold often prompting further investigation for malignancy. However, as demonstrated in reported cases, benign conditions like endometriosis and ruptured endometriomas can produce CA-125 levels that exceed 1000 IU/mL and, in extreme cases, approach or surpass 9000 IU/mL.<sup>(4,5,6)</sup>

## Case Report

A 43-year-old married nulligravida was brought to the emergency room in view of acute abdominal pain since one day, which was sudden in onset, dull aching in character, radiating to the back, associated with bleeding per vagina and vomiting. Patient had chronic vague pelvic pain for three years which got aggravated and presented as acute

abdomen. Patient had no history of amenorrhoea, dyspareunia, discharge per vagina, altered bowel and bladder habits. Patient has regular menstrual cycle of 6 days per month with average blood loss, no clots and dysmenorrhoea. On examination, patient was in acute distress with PR-100 & BP-110/70. On per abdomen examination, tenderness localised in the right iliac fossa, bimanual pelvic examination revealed retroverted fixed uterus of six weeks size with right adnexal fullness and mild tenderness in the fornices not associated with cervical motion tenderness. Fullness was present in the pouch of Douglas and no nodularity was felt.

On transvaginal ultrasound, uterus was retroflexed and multiple well defined fibroids in the anterior and posterior myometrium were seen, largest measuring 2.6 x 2 cm. Endometrial thickness was 4 mm, a well-defined collection with homogenous internal echoes measuring 6.7 x 3.7 cm was seen in the pelvis more so in relation with the right ovary, the visualised right ovarian tissue measured 5 x 2.7 cm. Few echogenic foci were seen within periphery of the collection in continuation with the above defined collection with the left adnexa. Free fluid was seen in the Morrison's pouch and in the right iliac fossa. Impression suggestive of ruptured endometrioma /ruptured haemorrhagic cyst with mild ascites.

Routine investigations were normal, Hb was 11.5g%. The CA-125 which was markedly elevated and measured 2799 U/mL.

In view of severity of symptoms with high serum CA-125 levels along with transvaginal scan findings, patient was scheduled for exploratory laparotomy and proceed. Intraoperatively, intrabdominal blood stained fluid of 300 cc was present in the peritoneal cavity. Uterus was normal in size and bilateral tubes were inflamed. Right and left ovary were densely adherent to intestine and posterior surface of the uterus and each other. The POD was obliterated by the right ovary completely and replaced by ruptured endometrioma of size 10 x 8 cm. Left endometrioma of 3 x 2 cm got ruptured during adhesiolysis, drained chocolate colored 30 cc of fluid. Total abdominal hysterectomy with bilateral salpingo-oophorectomy was performed in view of stage 4 endometrioma (Fig. 1,2) and sent for histopathology.

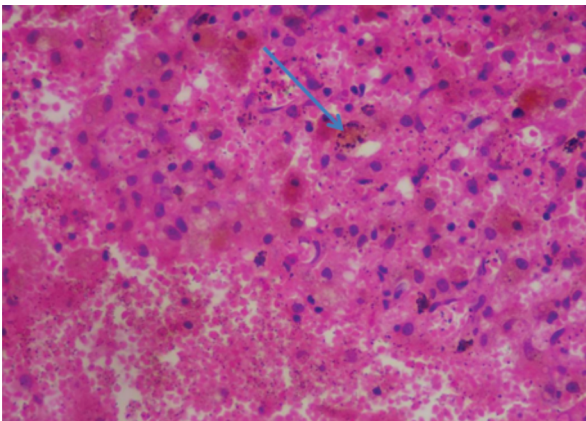
Histopathology confirmed the diagnosis of endometrioma (Fig. 3,4). The patient was discharged on postoperative day third with uneventful postoperative period. On routine follow up, repeat CA-125 reported 28 IU/mL.



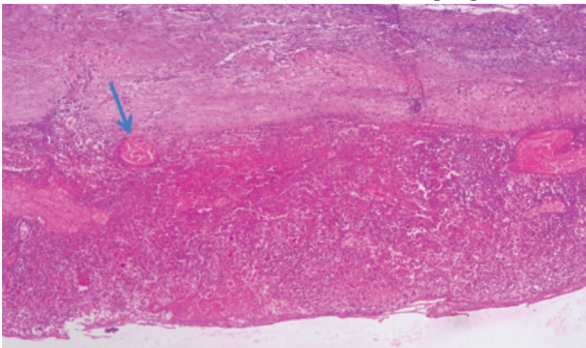
**Fig. 1: Uterus With Bilateral Fallopian Tubes With Ruptured Right Ovarian Endometrioma And Left Endometrioma.**



**Fig. 2: Uterus Cut Section Showing Intramural Fibroid.**



**Fig. 3: Histopathological Specimen Showing Ruptured Endometrioma With Hemosiderin Laden Macrophages.**



**Fig. 4: Histopathological Specimen Showing Ruptured Ovarian Upper Stroma With Hemosiderin Laden Macrophages.**

## DISCUSSION

Though CA-125 is primarily used as a tumor marker for ovarian malignancies, it is frequently elevated in benign conditions—notably endometriosis<sup>(7)</sup>. The mechanisms behind this elevation include peritoneal irritation, secretion by ectopic endometrial tissue, and, importantly, the diffusion of CA-125-rich cyst fluid into the peritoneal cavity following cyst rupture.<sup>(4,5,6)</sup>

In our case, the patient's serum CA-125 level was markedly elevated to 2799 IU/mL, which could have been mistaken for a malignant process. However, intraoperative findings and histopathology confirmed a ruptured endometrioma. Similar benign cases have reported CA-125 levels as high as 9391 IU/mL.<sup>(4,5,6)</sup> Studies indicate that endometriotic cyst fluid can contain CA-125 concentrations exceeding 10<sup>6</sup> IU/mL, and rupture can lead to a rapid rise in serum levels due to peritoneal absorption.<sup>(5,6)</sup> Moreover, it has been suggested that peritoneal mesothelial cells may contribute more significantly to serum CA-125 levels than even ovarian cancer cells.<sup>(8)</sup>

Recent reviews further support that CA-125 expression in endometriosis is regulated by inflammatory cytokines such as IL-1 $\beta$ , TNF- $\alpha$ , and IL-6, which stimulate CA-125 production by endometrial and peritoneal mesothelial cells, thereby enhancing its serum levels during acute or advanced disease states.<sup>(8)</sup>

According to a recent review article on the research progress of CA-125 in endometriosis (ScienceDirect), serum CA-125 levels have been found to be elevated in patients with endometriosis, particularly in those with moderate to severe disease.<sup>(9)</sup> The biomarker correlates with the extent of the disease, suggesting its utility in staging. Higher levels of CA-125 are more commonly observed in advanced stages (Stage III and IV), indicating a potential role in assessing disease severity.

Furthermore, CA-125 has shown promise in guiding treatment strategies. Elevated levels may suggest the need for surgical intervention, whereas patients with lower levels may benefit from medical management alone. Serial measurements of CA-125 can also help in monitoring therapeutic response and detecting recurrence post-treatment.

However, the specificity of CA-125 remains a concern, as it can be elevated in other gynecological and non-gynecological conditions, including pelvic inflammatory disease, menstruation, and malignancies. Therefore, while CA-125 is not a standalone diagnostic tool, its use in combination with clinical evaluation and imaging studies enhances diagnostic accuracy and aids in the comprehensive management of endometriosis.

## CONCLUSION

The present case underscores the clinical relevance of CA-125 not merely as a malignancy marker but also as a significant indicator in benign gynecologic conditions such as endometriomas. In cases of acute abdomen, particularly among reproductive-age women, an extremely elevated CA-125 should prompt consideration of benign etiologies like endometrioma rupture alongside malignancies.

Rather than serving as a definitive diagnostic tool, CA-125 functions best as a contextual marker—its interpretation should always be guided by clinical assessment, imaging, and intraoperative findings. Recognizing this nuance is crucial to avoid unnecessary alarm, inappropriate referrals, or overtreatment. This case highlights the need for increased awareness of benign causes behind CA-125 surges to facilitate timely, accurate, and less invasive clinical decision-making.

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