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CASE SERIES

Highlighting Unusual Surgical Manifestations of Pelvic Inflammatory Disease: Lessons from a Southern Rajasthan Case Series

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ABSTRACT
Pelvic Inflammatory Disease (PID) often presents diagnostic challenges due to its overlapping clinical features with other acute abdominal conditions. This case series highlights the diagnostic dilemmas associated with salpingitis and pelvic abscess, which can mimic conditions such as appendicitis. We retrospectively analysed 12 cases from Southern Rajasthan, focusing on atypical presentations and their clinical outcomes. The mean patient age was 26 years, with the majority presenting with right-sided pathology (9/12 cases). Imaging via ultrasound and CT proved invaluable but often lacked specificity, complicating differentiation from conditions like appendicitis and bowel perforation.
This report underscores the importance of a multidisciplinary approach involving surgeons, radiologists, and gynaecologists to improve diagnostic accuracy and treatment outcomes. Early recognition and timely surgical intervention are critical, especially in cases with atypical presentations, to prevent complications and reduce morbidity. Comprehensive imaging, histopathological evaluation, and interdisciplinary collaboration remain the cornerstones of effective management in complex PID cases.
Keyword- Salpingitis,Pelvic abscess, Pelvic Abscess, Pelvic Inflammatory Disease, Appendicitis, Pelvis Collection, Vaginal discharge, Sexually Transmitted diseases, Exploratory Laprotomy, Spontaneous Bacterial Peritonitis, Perihepatitis, First-Hugh-Curtis Syndrome.

INTRODUCTION

Pelvic inflammatory disease (PID) refers to an acute clinical syndrome that results when vaginal or cervical organisms ascend into the upper structures of the female reproductive tractunrelated to pregnancy or surgery. Depending on which areas are infected, PID may manifest itselfas endometritis, salpingitis, oophoritis, pelvic peritonitis and tubo-ovarian abscess.[1]

The common etiologic agents are *Chlamydia trachomatis, Neisseriagonorrhoeae,* and aerobic and anaerobic vaginal flora.[1]

Risk factors for PID include

- presence of a sexually transmitted infection
- a previous episode of PID
- sexual intercourse at an early age
- high number of sexual partners
- alcohol use [1]

Patients of PID may be symptomatic with lower abdominal pain, dyspareunia, fever, back pain, and vomiting, as well as symptoms of lower genital tract infection such as abnormal vaginal discharge or bleeding, itching, and odour or may be asymptomatic as well making the diagnosis challenging.The disease also has strong association with sexually transmitted infection and the potential for serious sequelae such as infertility and ectopic pregnancy contributing to the significant psychological distress that often accompanies a diagnosis of PID.[2]Given the nonspecific clinical manifestations, computed tomography (CT) is commonly the first imaging examination performed. General CT findings of early- and late-stage PID include thickening of the uterosacral ligaments, pelvic fat stranding with obscuration of fascial planes, reactive lymphadenopathy, and pelvic free fluid.[3]

Pelvic abscess & Salpingitis responds well to adequate antibiotic treatment unless progressed to Spontaneous bacterial Peritonitis or drainage of collection is not possible with minimal access; In which cases it is indicated to perform an Exploratory Laprotomy. Its variable presentation requires early

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recognition, diagnosis, immediate intervention like for the following presentations.

This article aims to explain the pathophysiology of Tubo-ovarian abscess, elaborates on the importance of imaging techniques in diagnosing Salpingitis, the challenges faced by a radiologist making a differential, and identifying high-risk patients requiring immediate surgical intervention.

The objective of this article is to also provide emphasis on the broadly inclusive diagnostic criteria in order to ensure identification of all potential cases, to explore the challenges, to prevent their sequelae and to highlight the gaps in research on PID.

A retrospective case study for 12 cases and analysis was done in Southern Rajasthan with patients that presented with disguised presentations and were eventually diagnosed with Pelvic Inflammatory Disease.

PATIENT CHARACTERISTICS

Due to the small sample size, no in-depth statistical analysis was devised. However,a thorough literature review was done to research more such cases references of which have been used to devise a conclusion and Management plan for such cases.

AND DATA ANALYSIS

MEAN AGE / YEARS: - 26 Years (Range 23yrs – 33yrs)
LEFT SIDED: - 3
RIGHT SIDED: - 9
EMERGENCY: ELECTIVE SURGERY – 7:4
OPEN REPAIR: MIS: Conservative –8:3:1
RECURRENCE – NONE (with follow up upto 2 years)

DIAGNOSIS RANGE

Appendicitis (6), Perihepatitis (Firts-Hugh-Curtis Synd) (1), Septic Abortion (1), Pelvic Abscess (3), Bowel Perforation (1)

Imaging via ultrasound and CT proved essential, though distinguishing between pyosalpinx, abscess, and appendicitis remained challenging. Recognising CT signs like obscured pelvic planes and uterosacral thickening aids timely diagnosis. Exploratory laparotomy was crucial in treatment, underscoring the importance of surgical intervention. This report emphasises the need for a multidisciplinary approach to optimise outcomes in complex PID cases, Few of such cases have been highlighted below in Cases 1-5.**Especially in cases of Right sided tubo-ovarian abscess and salpingitis were misdiagnosed as appendicitis, however in other cases diagnosis however rare but a differential was obtained on CT.**

- The cases that presented as acute appendicitis were managed under same protocol after difficult differential diagnosis like one such case is discussed, Two such patients were taken for Exploratory Laparotomy surgery and upon exposure with midline incision, with no history of previous surgery and relatively younger women and previous history of repeated attacks of Urinary tract infection along with Per vaginal discharge which was untreated for a chronic period of time, from which we concluded the need of immediate medical management. On exploration approximately 400 cc and 600 cc of pus collection respectively seen in Right pelvis which was drained and cavity washed. Inflamed tubular structure seen arising from a solid structure as seen in Figure 1,2 and diagnosed as salpingitis. Base of Appendix identified which was seen inflamed at base as Appendicitis as in Figure 3.
- After consent from the family and repeat consult with the obstetric surgeon Right Salpingectomy with Appendectomy was done, following which the bowel was thoroughly washed and drain placed. Pus culture for two of the relates cases came positive for Citrobacterfreundii resistant to most antibiotics which in turn was another medical challenge to switch Intravenous antibiotics and vaginal pessary to control the infection spreads to healthy ovary and fallopian tube. From which we concluded the need for simultaneous medical management.

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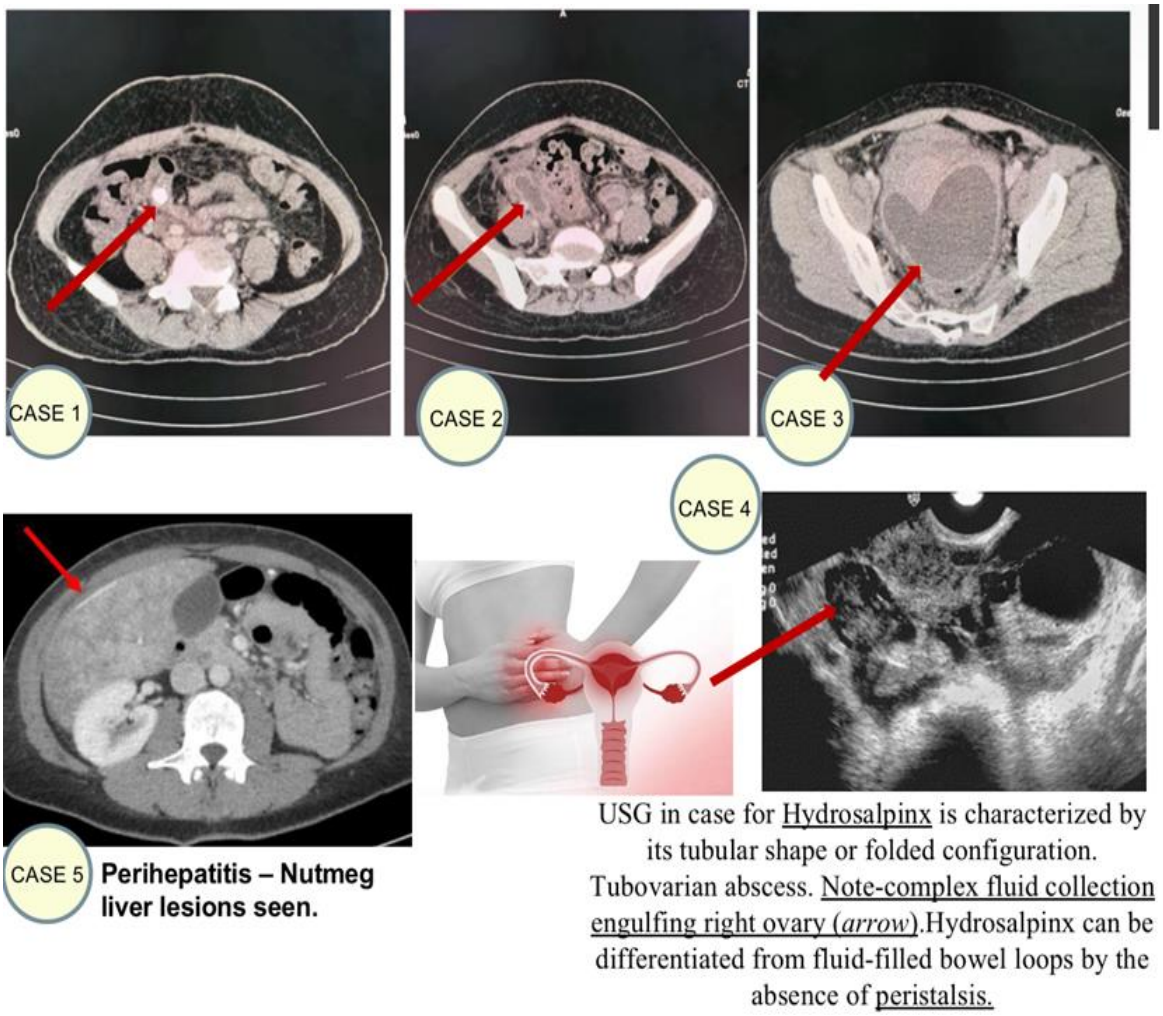

Cases 1,2 and 3 - Thick walled peripherally enhancing collection measuring approximately 9.4 x 9.3 x 10 cm seen involving the pelvis predominantly the rectouterine space as seen in Figure 3. The collection is seen compressing and displacing the uterus and rectum. There is surrounding fat stranding noted with non-visualisation of Right ovary. The above-described pelvic collection was seen causing compression over both lower ureters and Right and Left Pelvicalyceal system seen to be dilated. The collection was seen communicating with a tubular thick walled peripherally enhancing structure as seen in Figure 2 of approximate length 6 cm and maximum thickness measuring approx 1.8cm seen in right iliac fossa, A calcified structure of size 10x8mm seen adjacent to it. And (Figure 1) Sub centimetre to centimetre size mesenteric and right iliac fossa lymph nodes are noted.

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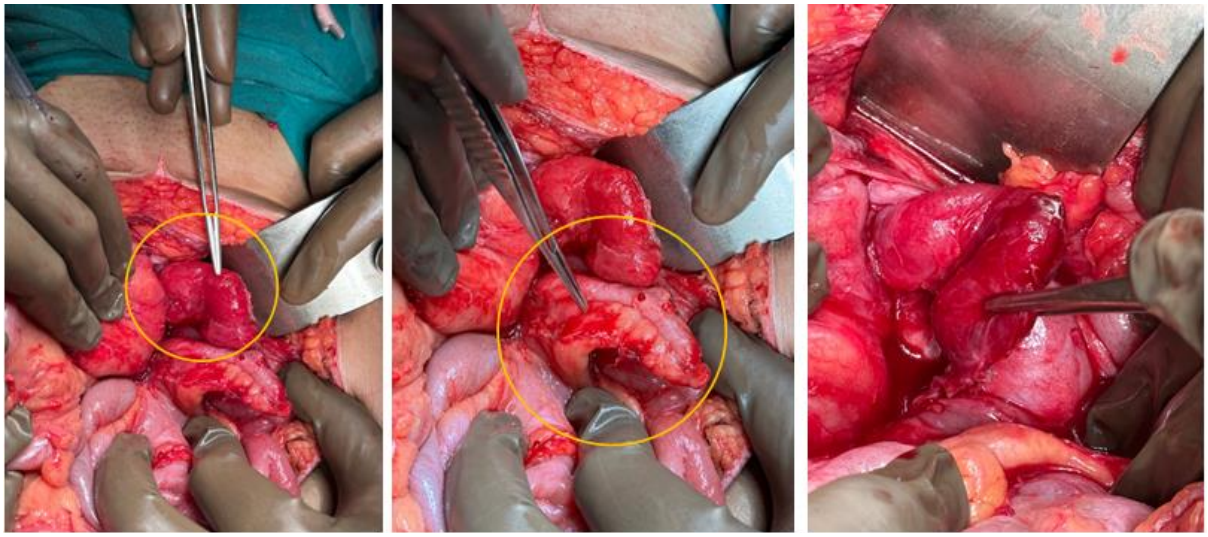

Figure 1,2 and 3

DISCUSSION

This case report presents a complex scenario involving a diagnostic challenge for both the surgeon and radiologist, highlighting the importance of timely recognition and intervention in cases of salpingitis and tubo-ovarian abscess. The chronic pelvic inflammatory disease (PID) post-normal vaginal delivery further complicated the clinical picture. The literature review emphasises the unusual nature of the case and highlights the need for a comprehensive understanding of the diverse presentations of pelvic abscesses.

Acute symptomatic PID presents with lower abdominal pain associated with fevers, chills, nausea, vomiting, vaginal discharge and/or inter-menstrual bleeding. PID may present with RUQ pain in the setting of liver capsular inflammation, also known as perihepatitis i.e. Fitz-Hugh Curtis Syndrome (3,7). However, the development of ascites as a presenting complication of PID is very rare. [3]

The diagnostic journey involved imaging techniques, where ultrasound and CT scans played crucial roles. The findings of a thick-walled peripherally enhancing collection involving the pelvis, compressing adjacent structures, and communicating with a tubular structure pointed towards a tubo-ovarian abscess. The challenges faced by the radiologist in distinguishing between pyosalpinx, abscess formation, and appendicular perforation underscore the complexity of such cases.

CT findings in early PID include obscuration of the normal pelvic floor fascial planes, thickening of the uterosacral ligaments, cervicitis, oophoritis, salpingitis, and accumulation of simple fluid in the endometrial canal, fallopian tubes, and pelvis. As the disease progresses, this simple fluid may become complex and the inflammatory changes may progress to frank tubo-ovarian or pelvic abscesses. Reactive inflammation of adjacent structures is common and can manifest as small or large bowel ileus or obstruction, hydroureter and hydronephrosis, right upper quadrant inflammation (Fitz-Hugh-Curtis syndrome), or peritonitis. Familiarity with the CT appearances of these manifestations is important for timely diagnosis and treatment of PID and its complications. [4]

Most often, ultrasonography is preferred over CT scanning as the triaging tool in a female child or adolescent with right lower quadrant or pelvic pain, particularly because of concerns about radiation exposure. Transvaginal sonography allows detailed visualisation of the uterus and adnexa, including the ovaries and thickened fallopian tubes.[5]

MRI serves as an excellent imaging modality in cases in which the ultrasonographic findings are equivocal. MRI findings in acute PID include cervicitis, endometritis, salpingitis/oophoritis, and inflammation in the pelvic soft tissues. In a study by Tukeva et al, the authors compared findings from MRI with sonograms and found that MRI was more accurate than ultrasonography in the diagnosis of PID. MRI has been reported to have sensitivity, specificity, and diagnostic accuracy of 95%, 89%, and 93%.

Occasionally, CT scanning may be used as the initial diagnostic study for the investigation of nonspecific pelvic pain in a female, and PID may be found incidentally. [5]

In a study by Okazaki et al of CT and MRI for the diagnosis of PID, contrast-enhanced CT had a pooled sensitivity of 79% and a specificity of 99%, and MRI had a sensitivity of 95% and a specificity of 89%. [5]

The surgical intervention, including right salpingectomy and appendectomy, was vital in addressing the identified pathology in this case however the management for such cases can be as follows.

Conservative Management- The ideal candidates for conservative management alone are women with no sign of sepsis and rupture, hemodynamically stable and, pelvic abscess greater than 8 cm on imaging. In a study by Granberg in 2009 stated that 25% of the patient fails to respond to conservative treatment A

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localised unilocular abscess more likely referred to post-surgical complications and generally requires surgical drainage. Once diagnosed, a combination of parental antibiotics should be started to treat the mixed-aerobic and anaerobic microbes. The gold standard antibiotics regimen is the combination of clindamycin or metronidazole with an amino glycoside, penicillin, or third-generation cephalosporins. Parental antibiotics should continue for 24 to 48 hours after the patient becomes afebrile and subsequently be switch to oral antibiotics.

Surgical Management and Drainage of a Pelvic Abscess - Recent evidence suggests that it is acceptable and beneficial for the patient to perform primary surgical drainage along with appropriate antibiotic coverage. It decreases the length of stay of hospitalisation and improves fertility outcomes. A study by Perez and medina reported that surgical drainage is needed if the size of the abscess is over 8 cm or failure to respond to adequate antibiotic treatment in 2 to 3 days.

The criteria for failure of treatment include increase in leucocyte count, tense and tender abdomen, despite the antibiotic therapy there is no reduction in the size of the abscess, new onset of fever, and increase in the size of the abscess. (7)

Different techniques are available for surgical drainage of the pelvic abscess, but in the past, the preferred approach was laparotomy. Many gynaecologists still prefer this surgical route for the removal and drainage of the surgical abscess. Most of the gynaecologist employs vertical incision in need for the proper visualisation of abdomen and pelvis. Following steps should be done in the removal and surgical drainage of the abscess:

- Always confirm the diagnosis first with the appropriate backup.
- Cultures are obtained upon entering into the peritoneal cavity and abscess itself.
- Surgically remove the abscess as much as possible if the abscess is in the ovary, an adnexectomy is likely necessary.
- Always irrigate the peritoneal cavity with normal saline to lessen the burden of infection.
- All the tissues removed sent for culture and histopathology.
- Leave in the closed suction drain until the output from the drain is minimal, and the patient improves clinically.[10]

Now the laparoscopic approach is being used for the drainage. The laparoscopic approach is being used more successfully in a patient with no exhibition of the rupture of an abscess. The choice between laparotomy and laparoscopy depends upon the determination and skill of the surgeon. However, the CT, MRI, or U/S guided drainage with antibiotics is the procedure of choice and has a success rate of 80% to 90%. A study conducted by Perez and Medina, states that these techniques have several advantages over laparoscopy, it requires no anaesthesia, less morbidity, decreases the length of stay in hospital. (8,9)

CT-guided transgluteal percutaneous drainage is a safe procedure, especially for deep abscess of post surgical type. It is a successful procedure where the anterior approach to the pus collection is not feasible. Endoscopic ultrasound (ESU)-guided drainage is another safe and effective method of draining in the pelvic abscess, which is not manageable to percutaneous drainage. Some of the recent studies have shown the effectiveness and safe use of intracavitary tissue plasminogen activator (tPA) for refractory and complicated abscess.

Rupture of the pelvic abscess is always a life-threatening emergency in such patient's immediate fluid resuscitation, and surgery is vital.

Differentials diagnosis of the pelvic abscess includes:

- Pelvic inflammatory disease
- Ectopic pregnancy
- Sepsis following miscarriage
- Appendicitis
- Renal colic
- Bowel obstruction
- Obturator hernia

The complication of a pelvic abscess includes ectopic pregnancy, the scar tissue from the previous inflammation and infection prevents the fertilised ovum to implant in the uterus and results in ectopic pregnancy. Infertility is another prevalent complication, adhesion as a result of abscess and inflammation causes severe damages the fallopian tube and ciliary epithelium and ovary and results in infertility. Chronic pelvic pain has seen in one-third of the patients, and pain is related to scarring and adhesions from the previous abscess and infection. [9,10]

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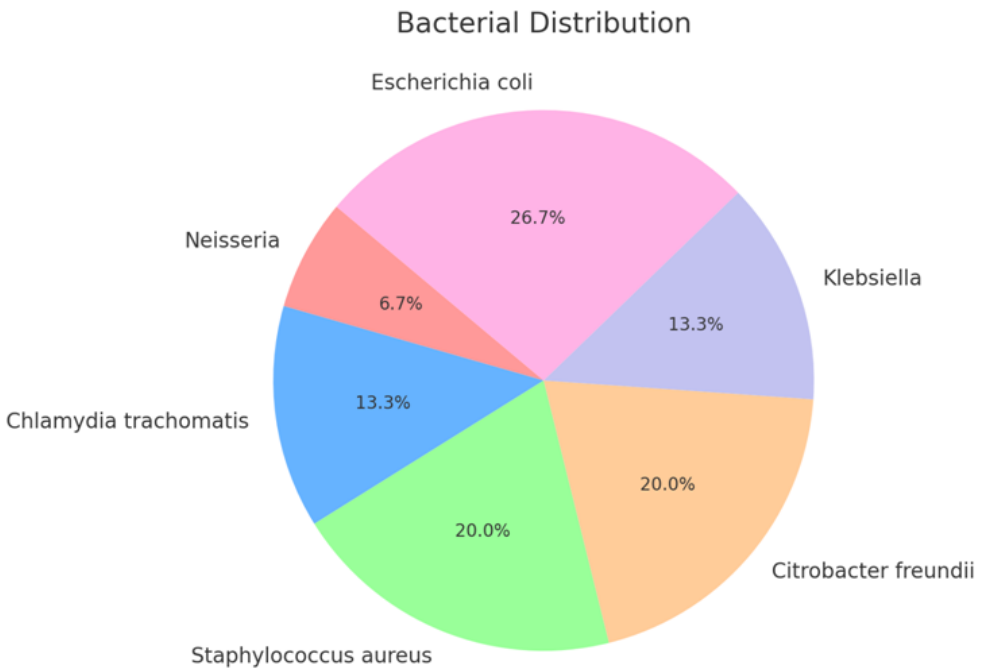

CONCLUSION

In conclusion, this case series highlights the diagnostic challenges associated with Pelvic Inflammatory Disease (PID), particularly in cases where it presents with atypical manifestations, such as salpingitis and pelvic abscesses mimicking conditions like appendicitis. Despite the limited sample size of only 12 cases, the report underscores the importance of considering PID as a differential diagnosis, especially in patients presenting with unusual or right-sided pelvic symptoms. While imaging techniques, such as ultrasound and CT, play critical roles in diagnosing PID, they often lack specificity, making a multidisciplinary approach essential for accurate diagnosis and treatment. The lack of a statistical analysis due to the small sample size limits the ability to draw definitive conclusions, but the presence of uncommon PID manifestations in these cases highlights the need for greater awareness and early intervention. Timely surgical management and appropriate antibiotic therapy are critical to prevent complications and improve patient outcomes, especially in cases where PID is initially misdiagnosed.

REFERENCES

1. Rekawek P, Friedman F. An unusual presentation of pelvic inflammatory disease: Case report and discussion. Austin Journal of Women's Health. 2014;1(1):3. Available from: [Link]
2. Hsu A, Sarowa BK, Abdessalam SF. Ruptured appendicitis leading to development of a tubo-ovarian abscess in a non-sexually active adolescent patient. Cureus. 2023 Jun;15(6):e41226. Available from: https://doi.org/10.7759/cureus.41226
3. Tabbalat A, Sheriff MZ, Chak A. Pelvic inflammatory disease as an unusual cause of ascites. The American Journal of Gastroenterology. 2021 Oct;116(Suppl):S1195. Available from: [Link]
4. Sam JW, Jacobs JE, Birnbaum BA. Spectrum of CT findings in acute pyogenic pelvic inflammatory disease. Radiographics. 2002 Nov 1;22(6):1506-25. Available from: https://doi.org/10.1148/rg.226025062
5. Agrawal A. Imaging in pelvic inflammatory disease and tubo-ovarian abscess. Updated Jun 13, 2023. Available from: [Link]
6. Webster DP, Schneider CN, Cheche S, Daar AA, Miller G. Differentiating acute appendicitis from pelvic inflammatory disease in women of childbearing age. Emerg Med. 1993 Nov;11(6):569-72. Available from: https://doi.org/10.1016/0735-6757(93)90002-s
7. El Hentour K, Millet I, Pages-Bouic E, Curros-Doyon F, Molinari N, Taourel P. How to differentiate acute pelvic inflammatory disease from acute appendicitis? A decision tree based on CT findings. PMID: 28894927. Available from: https://doi.org/10.1007/s00330-017-5032-4
8. Crossman SH. The challenge of pelvic inflammatory disease. Am Fam Physician. 2006 Mar 1;73(5):859-64. Erratum in: Am Fam Physician. 2006 Dec 15;74(12):2024. PMID: 16529095.
9. Mitchell CM, Anyalechi GE, Cohen CR, Haggerty CL, Manhart LE, Hillier SL. Etiology and Diagnosis of Pelvic Inflammatory Disease: Looking Beyond Gonorrhea and Chlamydia. J Infect Dis. 2021 Aug 16;224(12 Suppl 2):S29-S35. doi: 10.1093/infdis/jiab067. PMID: 34396407; PMCID: PMC8365120.
10. Revzin MV, Mathur M, Dave HB, Macer ML, Spektor M. Pelvic Inflammatory Disease: Multimodality Imaging Approach with Clinical-Pathologic Correlation. Radiographics. 2016 Sep-Oct;36(5):1579-96. doi: 10.1148/rg.2016150202. PMID: 27618331.