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Radiology

ROLE OF RADIOLOGY IN GYNAECOLOGICAL EMERGENCIES

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Abstract:

One of the challenges facing clinicians is the wide range of differential diagnosis of abdominal pain which mimics the gynaecological emergencies. In conjunction with clinical findings, various imaging modalities play a significant role in diagnosing abdominal pain caused by gynaecological problems and to rule out other causes of abdominal pain do to gastrointestinal and urological pathology. We have conducted this study at S.S. govt. medical college Rewa during the January 2013 to June 2016 on 28 female patients between the age group of 20 years to 35 years, attended the emergency department. Different radiological modalities were performed on these patients to diagnose and manage them. Out of 28 patients to were as ectopic pregnancy, 05 patients had pelvic inflammatory disease, 04 patients had adnexal torsion, 05 patients had uterine fibroids with acute presentation, 05 patients had ruptured corpus luteal cyst, 01 had haemorrhagic ovarian cyst, 04 patients had renal calculus with colic abdominal pain 01 patients was diagnosed as acute appendicitis and another 01 patients was diagnosed as acute cholecystitis

Key-words: *imaging, adnexal torsion, corpus luteal cyst, fibroids*

Introduction:

One of the challenges facing clinicians is the wide range of differential diagnosis of abdominal pain which mimics the gynaecological emergencies.

Acute abdominal pain related gynaecological pathology is a most common clinical symptom and presentation in the emergency department often it can be difficult to differentiate gynaecological from gastrointestinal and urological emergencies. Though is the correlation of clinical findings, pregnancy status and radiological findings, a prompt diagnosis allows potential remedy or life saving intervention. In patients presenting with pain that is thought to originate in the gynaecological tract, ultra sound is usually employed as the first imaging modality as it is highly sensitive, fast and easy to assess. CT is seldom used as an initial diagnostic tool in suspected gynaecological emergencies due to the risks associated with irradiating the pelvis. However it may be difficult to localize site of origin of the symptoms to the gynaecological tract due to the significant overlap in symptoms and signs caused by gastrointestinal and urological pathologies, and in this situation CT may be selected as the first imaging modality, MRI is not used in the acute setting but may be important in characterization of abnormalities that remains indeterminate following ultrasound or CT. This study was conducted at Govt. Medical College, Rewa during January 2013 to June 2016 on 28 patients of as group ranging from 20 years to 35 years to evaluate the role of imaging in gynaecological emergencies.

Commonly encountered acute gynaecological emergencies and other emergencies as under:-

Cyst emergency:

Ovarian follicles are identified on ultrasound and CT. Developing follicles are commonly seen as functional cysts during ultrasound examination, usually grow 2 mm per day until ovulation and measures less than 3 cm in diameter. If ovulation does not occur, a follicular cyst develops and appears as an anechoic cyst with a thin wall and posterior acoustic enhancement. Functional cysts are usually single, less than 6 cm in diameter and thin walled (< 3 mm). Follicular cysts usually reabsorb within a 4 to 8 wks period.¹ The corpus luteum forms after ovulation as granulosa cells become luteinized and blood accumulates in central cavity, hence corpus luteal cysts have a thicker, more echogenic wall with increased vascularity seen as peripheral blood flow on Doppler.²

4 patients were diagnosed as corpus luteal cyst rupture by USG and Doppler. 1 patient had intraperitoneal rupture which was diagnosed by CT.

Haemorrhagic ovarian cyst:

A haemorrhagic ovarian cyst is suspected if a patient presents with symptoms of acute lower abdominal pain, tenderness and in some cases ascites.²⁻⁴ Blood tests often show normocytic anaemia with only mild elevation of inflammatory markers such as CRP and leucocytes when compared to conditions such as appendicitis. Measurement of B HCG levels is also important in excluding pregnancy which can have a similar presentation.^{5,6}

We have diagnosed 1 case of haemorrhagic cyst by a trans-vaginal ultrasound which is the first imaging modality of choice for patients suspected of having an ovarian cyst haemorrhage. Use of Doppler is often

used to help to distinguish between malignant and benign ovarian cyst. Doppler ultrasound may demonstrate vascular wall and avascular internal lace like appearances of haemorrhagic corpus luteum.⁷ However ultrasound has its limitations in trying to identify whether a haematoma is originating from the fallopian tube or from ovary. In addition the non specific characteristic of presenting pain can often make CT more attractive first investigation in acute setting as it can exclude other intraabdominal causes.

Ectopic Pregnancy:

Ectopic embryonic implantation most commonly occurs at fallopian tubes (95%). Less common location include ovary, cervix, caesarian section scar of abdominal cavity. Patients classically present with a period of amenorrhea, per vaginal bleeding and abdominal pain. Serum B HCG levels and transvaginal ultrasound examination remain the mainstay initial investigations with CT and MRI plying a limited role.

Hallmark of sonographic features include pelvic free fluid in the presence of a complex adnexal mass. Ectopic pregnancy rupture is gynaecological emergency carrying 9 to 14% mortality rate during the first trimester of pregnancy. In the on call setting a CT may be performed due to non specific presentation. On CT, rupture ectopic may mimic other abdominal pathology, typically haemoperitoneum are free fluid identified. Ruptured ectopic pregnancy should be considered in women of child bearing age presenting with acute abdominal pain and free fluid/haemoperitoneum. We have diagnosed 2 patients of ectopic pregnancy by trans-vaginal ultrasonography.

Pelvic Inflammatory Disease:

5 patients were diagnosed as pelvic inflammatory disease during our study who attended the gynaecological emergency dept. for acute abdominal pain. PID described as spread of infection from endometrial cavity and fallopian tubes into pelvis. It encompasses endometritis, salpingitis and tubo ovarian abscesses. It usually affects women in the reproductive age grp and accounts for 25% of visits to the emergency department with gynaecological pains. The symptoms of PID are general aching pain in pelvis that varies in severity. Patients often have leucocytosis , increased inflammatory markers and may be febrile. A long course of antibiotic treatment is most common treatment of PID. Complications of neglected PID can have serious implications for the patients and include infertility, ectopic pregnancy, chronic abdominal pain and development of tubo ovarian abscess requiring surgical intervention. In the early phase of infection, it is common for ultrasound AND ct appearances to be normal. i the didease advances trans-abdominal ultrasound can demonstrate uterine enlargement and thickening of endometrium. Ultrasound can also show loss of tissue plains and ill defined uterus. Hydrosalpinx and pyosalpinx is a common complication of salpingitis. Tubo ovarian abscess frequently cause anterior displacement of broad ligament as the mesovarium is positioned more posteriorly and this can assist in making the diagnosis.⁸

Adnexal Torsion:

4 patients were diagnosed as adnexal torsion by ultrasonic and CT imaging. Adnexal torsion is the rotation of the ovaries,adnexa or the fallopian tube on its vascular pedicle.

Torsion is commonly asoosiated with the presence of benign ovarian tumours are cysts but may occur in structurally normal ovaries also. Ovarian cyst torsions should be considered in patients presenting acutely with iliac fossa pain. CT and sonographic examination are often carried out on call due to non specific presentation. Cross sectional examination typically reveals fallopian tube thickening, smooth wall thickening of the cystic mass, ascits and uterine deviation to the affected side. Sagittal MRI is particularly helpful in detecting the thickened tube. Unrecognized torsion can lead to haemorrhagic infraction. Haemorrhage within the tube or twisted ovarion mass, haemoperitoneum, eccentric smooth wall thickening leading to a thickened tube and lack of wall enhancement are feature of haemorrhagic infarction. Haemorrhage within the cyst can give rise to complex appearance mimicking ovarian neoplasm.

Adnexal torsion in structurally normal ovaries tends to occur in children secondary to increased adnexal mobility. The feature of torsions of normal ovary includes unilateral enlarged ovary, multiple peripheral non ovulatory follicles (string of pearls sign) ascites and a twisted vascular pedicle.

Dermoid cyst are prone to torsion and when unrecognized can result in gangrenous rupture leading to chemical peritonitis which is associated with significant morbidity.

FIBROIDS:

Acute presentations

5 patients of uterine fibroids presented for acute gynaecological problems in emergency dept. Fibroids (leiomyoma) are the most common

pelvic tumours affecting females in the fertile age group. They occur in 20-40% of females above 30 years of age .These benign smooth muscle tumors are sensitive to oestrogen which are thought to be a main contributory factor to fibroid growth over time. symptoms usually manifest during 4 decade.⁹ As fibroid may cause acute pain, patient may present at the emergency department. Acute pain may be caused by the degeneration of fibroid when it outgrows its blood supply, torsion of a pedunculated fibroid or prolapse of a submucous fibroid. Red or haemorrhagic degeneration is another type of acute fibroid degeneration seen in pregnancy and in patients on oral contraceptive pills, caused by thrombosis of venous outflow and resulting in a rapid increase in the size of fibroid with acute haemorrhagic infarction. Acute complications of fibroids are rarely seen but may be serious. Acute bleeding in fibroids can lead to hypovolumic shock and cause the death of patient.^{10,11} Ultrasound is often is the initial diagnostic imaging modality for suspected complications of fibroids. Simple fibroids is seen as a hypoechoic lesion that may be well defined and arising within the surrounding myometrium.fibroids can also demonstrate posterior acoustic enhancement or attenuation without any calcification. Degeneration of fibroids gives a more complex ultrasonographic appearance with areas of cystic change and Doppler can show circumferential vascularity. Fibroids that are torted or are necrotic will show absence of flow on Doppler ultrasonography.

In acute presentation of pain, fibroid degeneration on CT may show a cystic appearance of fibroid mass with reduced enhancement and hypodense areas.

Fibroid degeneration can often be difficult to distinguish from cystic ovarian masses on CT and MRI is often needed to distinguish between them. MRI can be very helpful in this respect when investigating suspected acute fibroid complications.

4 patient of renal calculus, 1 pt. of acute appendicitis and 1 patient of cholecystitis who presented as acute abdominal pain and mimic the presentation of gynaecological emergencies were diagnosed by imaging modality ultrasound, CT and MRI.

Conclusion:

In cases of suspected gynaecological disease the finding on imaging must be interpreted in association with clinical presentation, signs and symptoms. The pregnancy status of patient must be established in order to exclude ectopic pregnancy and to avoid using imaging modality which pose a risk to the fetus. Clinical signs of sepsis can make the clinician more suspicious of PID. Haemorrhagic ovarian cyst can give a charactersic internal reticular pattern on ultrasound with high attenuation content on non contrast CT, an enhancing cystic wall and contrast enhanced blood in pelvis on delayed phases in cases of cyst rupture where adnexal torsion is suspected. Doppler can demonstrate characterstic whirlpool or corkscrew signs of twisted vascular pedicle. Contrast enhanced CT and MRI may demonstrate reduced enhancement in the twisted ovarian mass is another diagnostic feature of torsion. Where torsion is suspected clinically but diagnostic imaging features are not demonstrated, it should be remember that imaging can not be relied upon to confirm the diagnosis. MRI is the most effective modality for

characterization of fibroid degeneration. In most presentation of gynaecological emergencies USG and occasionally CT can be the simplest and quickest way to assess the patient. MRI reserved for further characterization of complex masses and problem solving overlap in the presenting features of acute gynaecological, gastrointestinal and urological disease remains a significant challenge in the emergency dept. and imaging playsv an important diagnostic role.`

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