

Patient's Data

- Age: 40 yr/o
- Sex: Female
- Marital status: Married
- Date of Admission: 93/01/11
- Source of information: From old chart



Chief Complaint

- Irregular menstrual periods for several months since last operation



Present Illness

- A 40 yr/o female patient
- GYN/OBS history of G0P0SA0AA0
- Irregular menstrual periods and lower abdominal pain for several months since last operation for pelvic adhesion and pseudocyst in Nov 2002
- Regular follow-up at Dr. 劉's OPD
- Sonography performed(93/01/02), revealed large pelvic cyst, size: 15x10cm & myoma uteri at posterior wall of size: 2x3cm
- Under impression of adenomyosis, admitted for further management and surgical procedures.



Past History

Past Medical History

DM (-), HTN (-), CVD (-),
Gout (-), Asthma (-)

Past Surgical History

1. Myoma s/p myomectomy on 90/08/29
in Veterans hospital
2. Pelvic adhesion and pseudocyst s/p
op on 91/11/11 in TMUH



Personal History

- Smoking: None
- Alcohol: None
- No known drug allergy
- No known food allergy



GYN/OBS History

- 1.G0P0SA0AA0
- 2.Menarche:13 yr/o
- 3.Dysmenorrhea: (+)
- 4.Intermenstrual bleeding: NiL
- 5.Intercourse experience: (+)
- 6.Regularity: Regular



Family History

 Father had asthma



Physical Examination

General appearance: Fair

Consciousness: Clear E4V5M6

Vital signs: BT:36.3oC PR: 80/min RR: 18/min BP: 110/80mmHg

Chest: Symmetrical expansion BS: clear bilaterally

Heart :RHB without any murmur

Abdomen: Soft & flat, mild tenderness over lower abdomen, palpable mass present at lower abdomen, no rebounding pain, no muscle guarding, no Murphy's sign

Bowel sound: Normoactive

Liver span: 8 cm over RMCL

No hepatomegaly, no splenomegaly

PV: Uterus - large in size, not smooth in contour, adenomyosis

Cx: No spotting, Bilateral adnexa – free, no mass

CDS - free, no tender nodules



Laboratory Data

 **CBC/DC(pre-op)** 93/01/11

WBC:6290 uL **RBC:3.76x10⁶ uL (L)**

HGB:11.8g/dL (L) **HCT:34.4% (L)**

MCV:91.4 fL PLT:351x10³ uL

Neut:51.1%

U/A:WNL PT & aPTT: 10.4 & 27.3

GLU:123mg % **BUN: 20mg/dL (H)**

CRE: 0.7mg/dL GOT:17 IU/L GPT:16 IU/L

e-: Na:139 K:3.9 Ca:9.4 **Cl:109 mEq/l (H)** Alb:4.1g/dl

CA-125: 139 U/ml (H) (Normal range: <35)

CA-199: 35.3 U/ml (Normal range: <37)

Prolactin: 38.31 ng/ml (H) (Normal range:2.5 -25)

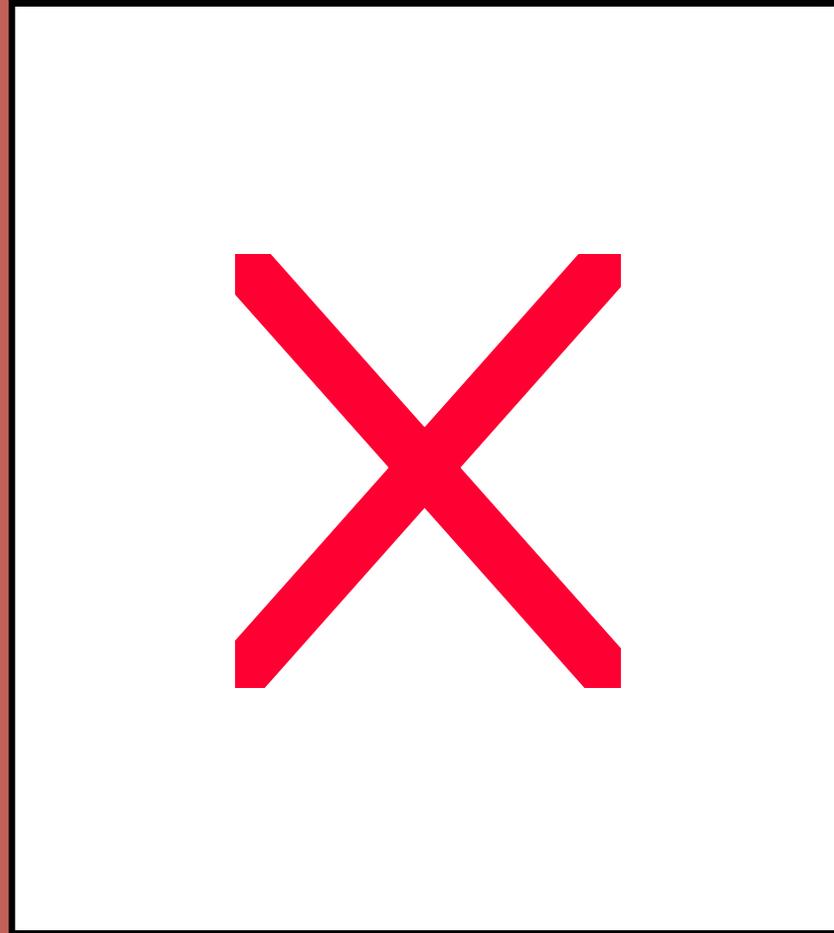
EKG: NSR



Imaging Findings-1

Chest PA/AP 93/01/11

Well expansion of lung without thoracic cage deformity. Normal appearance of diaphragm. No identified bony lesion. No active lung lesion could be noted. Normal cardiac shadow.

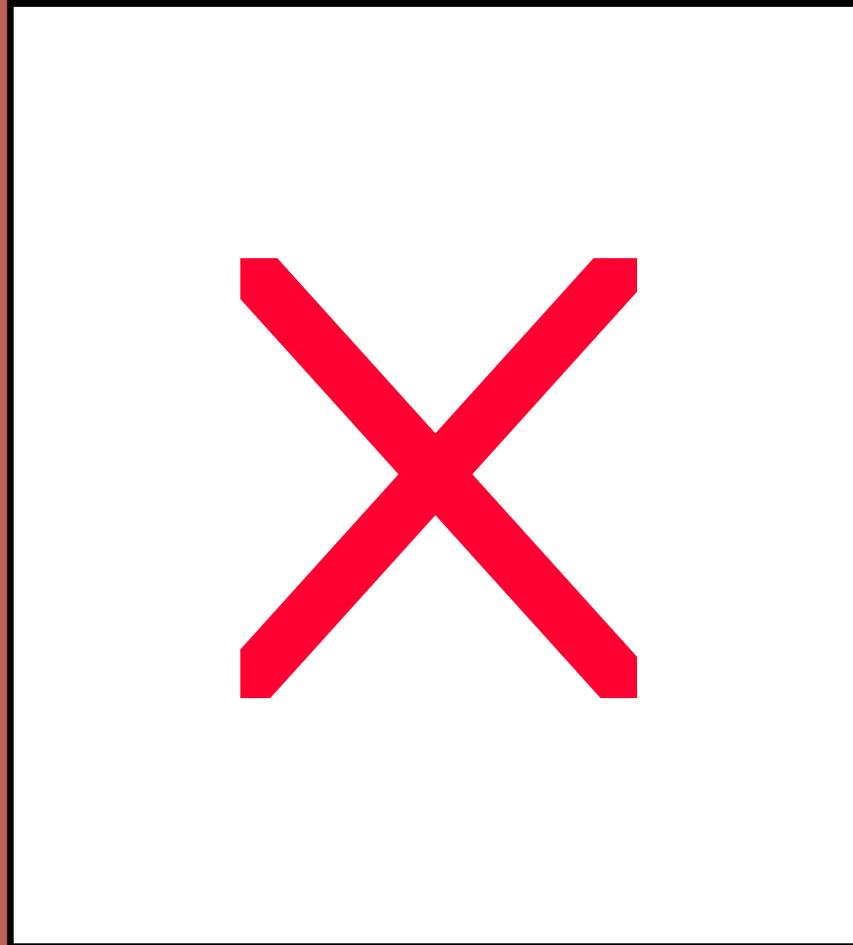


Imaging Findings-2

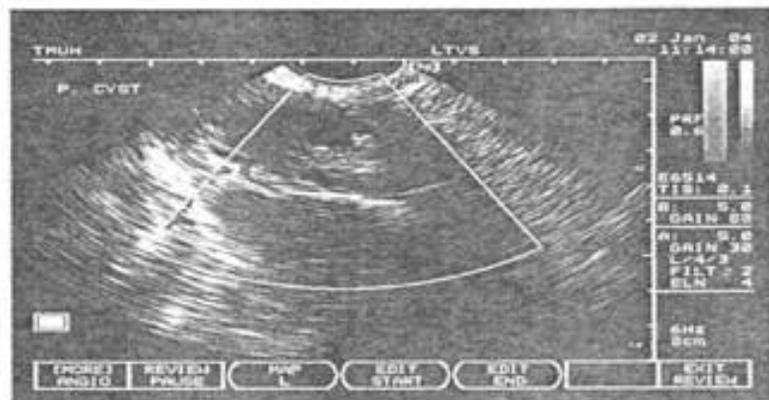
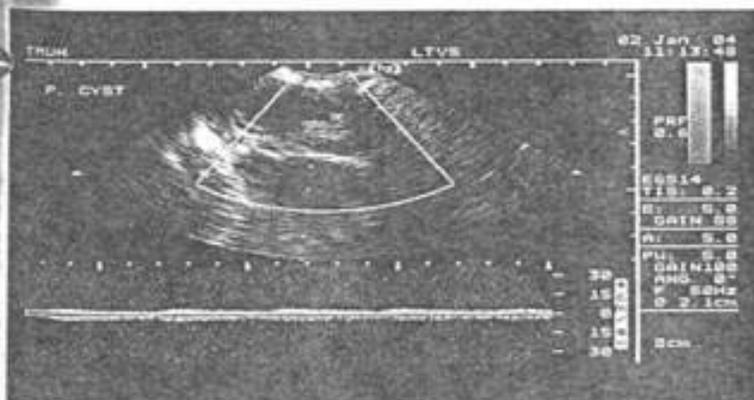
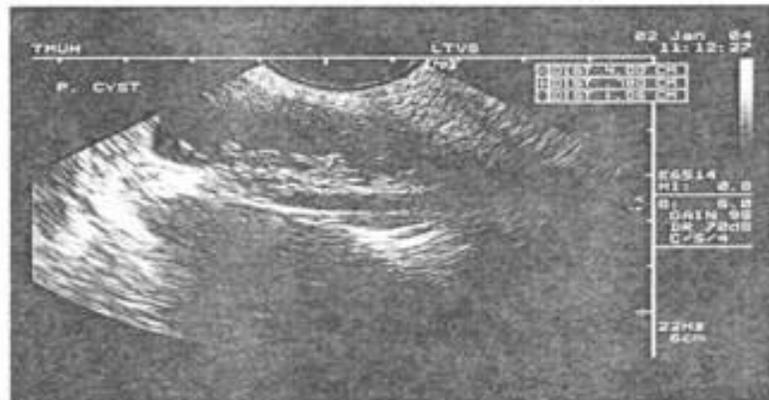
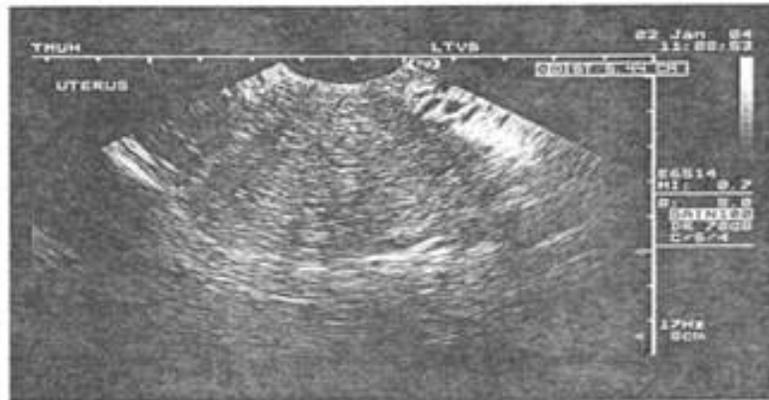
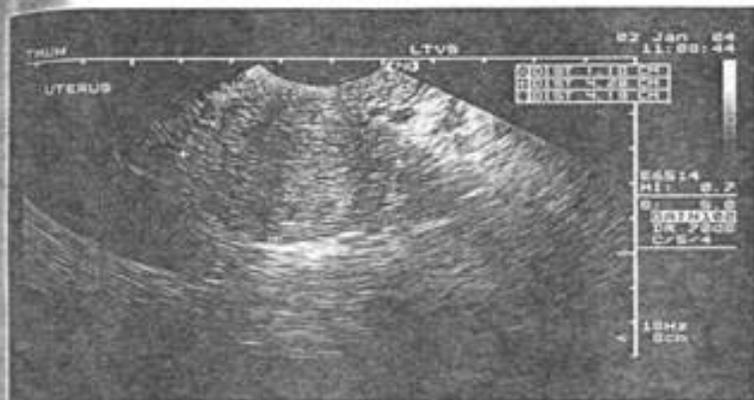
 **KUB 93/01/11**

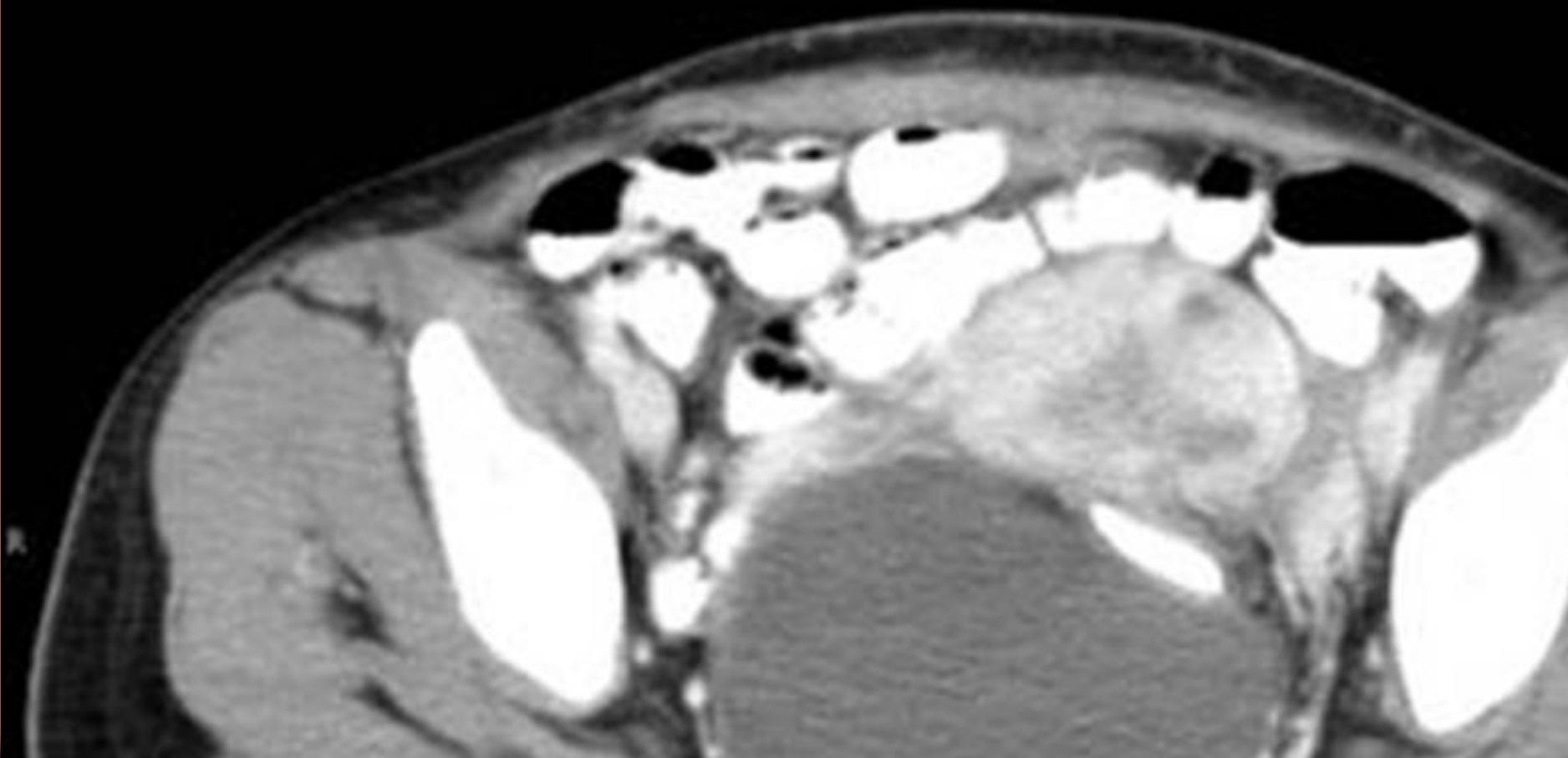
Spinal convexity
towards Lt side at
mid -T level.

Spinal convexity
towards Lt side at
mid-L level.



姓名: 吳美燕 病歷號碼: 756934 門診日期: 93/01/02





Sonography-93/01/02

- Findings: Right pelvic cyst with papillary component (with angio flow++)
- Clinical Diagnosis: Adenomyosis & endometrioma
- **IMP: 1)Right pelvic cyst 2) Irregular echoes observed within uterine**



CT Imaging-93/01/03

- Pre-and post-contrast abdomen and pelvis CT study is performed.
- There is a huge non-enhanced cystic lesion, measured about 10.1cm x 9.4cm x 12cm in largest dimension at the presacral region. This lesion causes the anterior displacement of the uterus and the recto-sigmoid colon.



CT Imaging - 2

- The uterus is anteverted and enlarged. There are several focal hyperintense spots noted.
- The uterus has a thickened posterior myometrium and a widened junctional zone.
- The adnexa appear normal on both sides.



CT Imaging - 3

- A 0.5cm x 0.8cm cyst is noted at segment V of the liver.
- A 0.7cm renal cyst is noted in the left kidney.
- The spleen, pancreas and right kidney are unremarkable
- There is no definite enlarged para-aortic or pelvic sidewall lymph node.
- **Impression: Pelvic cystic mass r/o malignancy, adenomyosis, leiomyoma, endometriosis**



Pre-Op Impression

 **Pelvic cystic mass r/o malignancy**



Differential Diagnosis

 Adenomyosis

 Leiomyoma

 Endometriosis



Differential Diagnosis

■ Leiomyoma

Reasons:

Symptoms: Irregular menstrual periods & pelvic pain

Physical examination: An enlarged uterus

Lab data: Anemia

Sonography: Pelvic mass present, myoma uteri at posterior wall 1) Right pelvic cyst (angio-flow +) 2) Irregular echoes observed within uterine

CT findings: Huge non-enhanced cystic lesion, measured about 10.1cm x 9.4cm x 12cm in largest dimension at the presacral region. This lesion causes the anterior displacement of the uterus and the recto-sigmoid colon.

Require MRI for further differential diagnosis



Differential Diagnosis

Endometriosis

Reasons: Occurs mainly in premenopausal women & in nulliparous women

Symptoms: Pelvic pain

Physical examination: Lower abdomen tenderness

Lab data: CA 125 elevated

Sonography: 1) Right pelvic cyst 2) Irregular echoes observed within uterine

Confirmed diagnosis with laparoscopy



Surgical Procedure Performed

- **Subtotal hysterectomy & pelvic adhesionolysis (93/01/13)**



Post-op findings

- A huge pseudo-inflammatory cyst containing fluid, of size:12x12x10cm with severe pelvic adhesion is found.



Pathology Report-93/01/16

- Uterus, corpus, laparoscopic assisted subtotal hysterectomy
- Findings: 1 tissue fragment measuring 8x7x3cm in size, fixed in formalin. Grossly, it is an irregular-shaped corpus tissue fragment with many hemorrhagic spots and small cysts. Microscopically, it shows a picture of adenomyosis with endometrial glands and their stroma embedded in the myometrium.
- **Clinical diagnosis: Adenomyosis**



Post-op diagnosis

- **Adenomyosis**
- **Severe pelvic adhesion**



Post-op management

 Medications & OPD follow-up



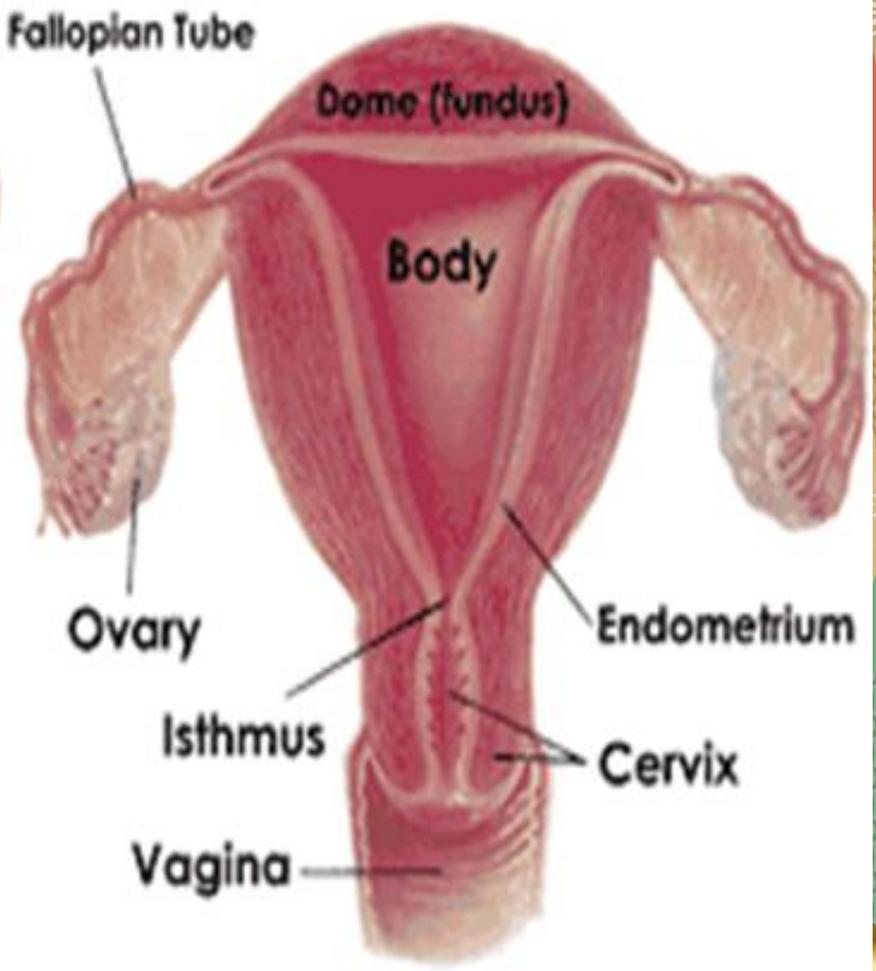
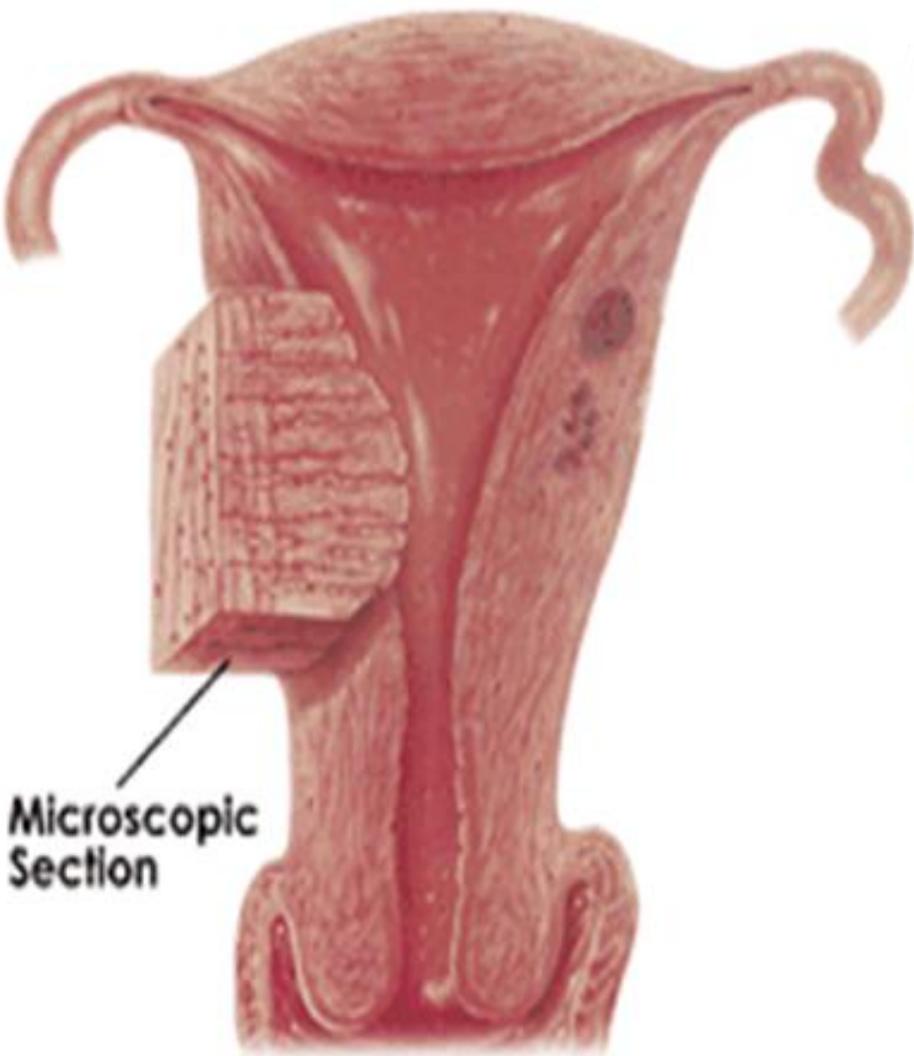
Discussion: ADENOMYOSIS

- Penetration and growth of endometrial tissue from the uterine lining into the myometrium (uterine muscle)
- Occurring at interface between endometrium and myometrium (fibrous & muscular tissue of the uterus)
- Smooth muscle hyperplasia and an altered local immune environment



ADENOMYOSIS

NORMAL UTERUS



Front view - Adenomyosis

Front view of healthy uterus





Adenomyosis. Note thickened wall of uterus which can be mistaken for fibroids.



Adenomyosis

- Benign disease
- Affects the posterior wall of uterus
- May coexist with external endometriosis (endometrial implants are located outside the uterus)
- 3 categories: 1) limited to basal layer 2) in the deep layers 3) in the surface layers
- New category: Intramyometrial cystic adenomyosis.



Pathophysiology

- The abnormally located endometrial tissue, like the normal endometrium, tends to bleed with the menses
- Blood and debris may accumulate in the misplaced glands creating small fluid collections inside the uterine wall
- The penetrating and functioning endometrial tissue may lead to swelling; the uterus may become larger and globular
- May present as a diffuse condition or may be focal



Incidence

- Exact prevalence is not known
- Since diagnosis can be made only by microscopic examination of uterine specimens obtained during surgery or, less often, during biopsy. Only in recent years has MRI imaging been able to diagnose adenomyosis without doing a hysterectomy.
- In studies of chronic pelvic pain in women who had hysterectomies, the incidence is about 15% to 25%
- Same incidence in hysterectomy specimens from women without pain as from women with pain
- With careful microscopic analysis of multiple myometrial samples from an individual uterine specimen, the prevalence increases to 65%.



Causes

- Unknown
- Most widely accepted theory :Barrier between the endometrium and myometrium, which normally prevents invasion of endometrial glands and stroma into the myometrium, is compromised allowing invasion to occur.



Risk factors

- Affects premenopausal and perimenopausal women (late reproductive years)
- Usually those who are multiparous and older than 30 years
- Affects women between ages: 40 and 50 years
- Rarely occurs in women who have not carried a pregnancy to term



Symptoms

- Dysmenorrhea (severe cyclic cramping or knifelike uterine pain or pelvic pain during menstruation)
- Menorrhagia (prolonged and/or profuse uterine or menstrual bleeding, with passage of clots)
- Uterine enlargement :The uterus is often 2-3 times the normal size (large globular uterus)
- Other findings : chronic vaginal bleeding and unresponsiveness to hormonal therapy or uterine evacuation
- May cause infertility
- Note: In many cases, the patient may be asymptomatic.



Signs & Tests

- Pelvic examination
- Pelvic Ultrasonography (Transvaginal Ultrasound)
- Magnetic Resonance Imaging (MRI)
- Endoscopy and hystero-graphy
- Myometrial biopsy
- CA 125



Clinical Diagnosis

Preferred Examination:

- **Transvaginal sonography (TVUS) or Magnetic resonance imaging (MRI)**

Limitations of Techniques:

- Hysterosalpingography (HSG) and transabdominal sonography (TAUS)
→ lack specificity
- CT → inability to resolve subtle differences in soft-tissue attenuation, lack sensitivity



Diagnostic Tests

- **Pelvic examination** : A normal, or only slightly enlarged uterus to a very firm tender uterus enlarged to twice the normal size may be observed
- **Myometrial biopsy**: taken transabdominally at the time of laparoscopy, or transvaginally under ultrasound guidance
- A positive biopsy : ectopic endometrial islets sandwiched between strips of myometrium. Endometrial glands and stroma at the extreme end of the needle core may represent eutopic endometrium and such biopsies should be regarded as negative
- The sensitivity of random needle biopsies is low and dependent on the number of biopsies and the depth and extent of mucosal infiltration.
- This is unsuitable for those who still want to have children. Its accuracy has not yet been compared to conventional histological assessment of hysterectomy specimens



CA 125

- **CA 125:** Adenomyosis is associated with increased numbers of myometrial macrophages, elevated antiphospholipid auto-antibodies and CA 125 levels in peripheral blood, and deposition of IgG, C3 and C4 in ectopic foci
- Peripheral CA 125 levels are potentially useful as a serum marker for adenomyosis



Endoscopy and hystero-graphy

- An **hysterosalpingogram** (pelvic x-ray after filling the uterus with a contrast medium):The x-ray may show the diagnostic sign of contrast-filled spaces in the uterine wall. However, this finding is not consistently present and its extent on the x-ray may not reflect the extent of the disease.
- The most characteristic feature of adenomyosis on hystero-graphy is the presence of ill defined areas of contrast intravasation extending perpendicularly from the uterine cavity into the myometrium.
- Unfortunately, the sensitivity of this technique is too low for clinical practice
- Diffuse myometrial distortion detected at the time of laparoscopy or hysteroscopy may indicate extensive adenomyosis but may also be caused by multiple small fibroids.
- It is unlikely that mild or moderate adenomyosis can be diagnosed visually.



Pelvic Ultrasonography - 1

■ **Pelvic Ultrasonography (Transvaginal Ultrasound)** : enhanced resolution makes it superior to the transabdominal approach

■ **ULTRASOUND CHARACTERISTICS OF ADENOMYOSIS**

- ill defined hypoechoic areas
- heterogeneous myometrial echo texture
- small anechoic lakes
- asymmetrical uterine enlargement
- indistinct endometrial-myometrial border
- subendometrial halo thickening



- Adenomyosis: Irregular myometrial cystic spaces predominantly involving the posterior uterine wall; an enlarged uterus with a widened posterior wall (see Image 1)
- Sonograms may also show ill-defined margins between the normal myometrium and the abnormal myometrium, as well as elliptically shaped myometrial abnormality.
- Sagittal transabdominal sonogram of an enlarged uterus with a thickened posterior myometrium (arrows) (see Image 2)



Pelvic Ultrasonography-3

- Heterotopic endometrium extending into the inner myometrium can appear as echogenic linear striations. When these lines are small or indistinct, pseudo-widening of the endometrium or poor delineation of the endomyometrial junctional zone is seen.
- Endovaginal sonography, especially with a Doppler technique, can be used as the initial imaging modality to determine the presence of adenomyosis.



Pelvic Sonography- 4

- The most common appearance of adenomyosis is areas of decreased echogenicity or heterogeneity in the myometrium.
- The areas of decreased echogenicity are the areas of smooth-muscle hyperplasia. The areas of heterogeneity are small, echogenic islands of heterotopic endometrial tissues surrounded by hypoechoic smooth muscle.
- Dilated cystic glands or hemorrhagic foci within the heterotopic endometrial tissue cause the appearance of small myometrial cysts that are smaller than 5 mm in diameter. These are seen in about 50% of patients.



Magnetic Resonance Imaging-1

- Best technique for the presurgical diagnosis of adenomyosis and most studies have reported very high positive and negative predictive values
- Capable of detecting the presence and extent of adenomyosis and distinguishing it from fibroids.
- Pelvic MRI should be performed with the IV contrast medium Gadolinium and include contiguous 4mm sections through the uterus



Magnetic Resonance Imaging-2

- MRI is more expensive than ultrasonography
- Used in cases with indeterminate sonographic results or in patients who are undergoing uterine-sparing surgery for leiomyomas.
- Thin-section, high-resolution MRIs obtained with a pelvic multicoil array are optimal for diagnosing adenomyosis. The uterine zonal anatomy is best seen on T2-weighted images.
- Variations in the normal thickness of the inner myometrium or junctional zone have been reported with a mean thickness of 2-8 mm. Widening of this junctional zone has been associated with adenomyosis
- Junctional zone widths between 6 and 12 mm have been quoted as diagnostic for adenomyosis . (see Image 3)
- Findings of focal hyperintensity on T2-weighted images (see Image 3) confirm the diagnosis of adenomyosis.



Magnetic Resonance Imaging-3

■ Uterus, adenomyosis. Sagittal MRI of an enlarged uterus with a thickened posterior myometrium. T2-weighted image without gadolinium enhancement shows a widened junctional zone of 23 mm (arrows) and focal high signal intensity (arrowheads).



Magnetic Resonance Imaging-4

- The bright foci seen in the myometrium on T2-weighted images in 50% of patients (see Image 3) are islands of heterotopic endometrial tissue or cystic dilation of heterotopic glands or hemorrhage.
- Whether the hemorrhage is from hormonal changes or spontaneous causes is not known.
- Sometimes, linear striations of decreased signal intensity can be seen radiating out from the endometrium into the myometrium on T2-weighted images.
- These striations are the direct invasion of the basal endometrium into the myometrium.
- When the striations blend or become indistinct, pseudo-widening of the endometrium is seen.



Magnetic Resonance Imaging-5

- **Degree of Confidence:** The reported accuracy of MRI for diagnosing adenomyosis is high.
- Its sensitivity and specificity are 80-100%, with an overall accuracy of 85-90.5%.



MRI & Ultrasound-Overall Summary

- Adenomyosis should no longer be a retrospective diagnosis after hysterectomy. Both endovaginal ultrasonography and MR imaging are useful for the diagnosis.
- Use of MR imaging has been limited by its restricted availability and cost. Most MR studies of the pelvis last for 30 minutes or longer. Advances in MR technology are likely to reduce the imaging time.
- The sonographic characteristics of adenomyosis are subtle and adenomyosis will remain undiagnosed if not considered. However, in experienced hands sonography can be almost as accurate as MR imaging.
- MRI or ultrasound diagnosis is based on recognising the distortion of the normal inner myometrial architecture caused by smooth muscle hyperplasia
- Overall, both MRI and ultrasound (in expert hands) detect adenomyosis in over 90% of cases



Treatment-1

Conservative medical treatment

- For asymptomatic patients, no treatment is required
- The first choice for medical therapy for the pain:
Gonadotropin-releasing hormone agonists (GnRH) e.g.
Lupron
- Temporary relief of very painful heavy periods limited to six months use.
- Treat infertility associated with adenomyosis.
- Recurrence of adenomyosis after discontinuing the therapy
- It can be used to reduce the amount of adenomyosis and the remaining areas can be resected for those who still want to get pregnant



Treatment-2

Surgical Treatment

- Hysterectomy: For symptomatic adenomyosis
- The reported mortality and morbidity rates are 1-2 deaths per 1000 cases and 25-50%, respectively
- Over 80% effective in eliminating pain and abnormal bleeding for a woman who has finished childbearing and is willing to undergo surgery
- For abnormal bleeding problems and uterine conservation, a progesterone intrauterine contraceptive device can be used to improve irregular bleeding



Treatment-3

Other Therapies

Hysteroscopic endometrial ablation

- ~ Success rate of improving heavy menstrual periods (about 60%)
- ~ A good non hysterectomy choice for women with predominantly abnormal uterine bleeding, high operative risks, or who are adverse to removal of the uterus.

Laparoscopic myometrial resection or open myometrial resection treatment

- ~Used for focal adenomyosis



Treatment-4

Newest Advancement

- Uterine-artery embolization with polyvinyl particles may relieve signs or symptoms of adenomyosis e.g.heavy vaginal bleeding



Thank you for your attention !

