Rare tumours in pregnancy - pictorial review.

Poster No.: C-2360
Congress: ECR 2015
Type: Educational Exhibit
Authors: M. Rowe, C. Davies, S. Otero, J. Hillier, J. Bridges, P. Narayanan; London/UK
Keywords: Diagnostic procedure, MR, Obstetrics (Pregnancy / birth / postnatal period), Pathology
DOI: 10.1594/ecr2015/C-2360

Any information contained in this pdf file is automatically generated from digital material submitted to EPOS by third parties in the form of scientific presentations. References to any names, marks, products, or services of third parties or hypertext links to third-party sites or information are provided solely as a convenience to you and do not in any way constitute or imply ECR’s endorsement, sponsorship or recommendation of the third party, information, product or service. ECR is not responsible for the content of these pages and does not make any representations regarding the content or accuracy of material in this file.

As per copyright regulations, any unauthorised use of the material or parts thereof as well as commercial reproduction or multiple distribution by any traditional or electronically based reproduction/publication method is strictly prohibited.

You agree to defend, indemnify, and hold ECR harmless from and against any and all claims, damages, costs, and expenses, including attorneys’ fees, arising from or related to your use of these pages.

Please note: Links to movies, ppt slideshows and any other multimedia files are not available in the pdf version of presentations.

www.myESR.org
Learning objectives

The aim of this exhibit is:

1. to review the occurrence of rare tumours in pregnancy
2. to review diagnostic approaches, including imaging pathways in pregnant patients
3. to review case management based on a selected series of patients
Background

Tumours in pregnancy

The occurrence of tumours in pregnant women, both benign and malignant, is rare: for ex. the incidence of the malignant tumours ranges from 0.07% to 0.1% of all malignant tumours [1]. Both categories pose a diagnostic and therapeutic challenge as they involve the mother and the foetus and there are no set standards for the management of these patients. However, there are few basic rules that are commonly accepted: first to try to reach an accurate diagnosis and in case of benign pathology to minimise the risk of obstetric complications, whereas in case of malignancy, try to benefit's mother's life, treat curable cancers, protect the foetus from harmful effects of the treatment and retain mother's reproductive system for the future.

In our pictorial review we present a series of rare tumours in patients referred by Gynaecology and Pregnancy Services such as:

1. ovarian complex cyst
2. degenerating fibroid
3. dermoid cyst
4. desmoid tumour of the abdominal wall
5. Sertoli-Leydig tumour arising from the ovary

and discuss the challenges arising in imaging these patients.
Findings and procedure details

Imaging in pregnancy

The imaging plays a very important role in the diagnostic pathway of pregnant patients and a modality that does not use ionizing radiation (US or MR imaging) should be the first imaging procedure of choice.

- Ultrasonographic imaging is safe and useful and may provide sufficient information to plan further management.

- If ultrasound findings are equivocal, then MR imaging should be the next line of investigation. However, it should be avoided in the first trimester. The use of intravenous Gadolinium at any stage of pregnancy should be avoided. The patient can be informed that there are no known harmful effects from use of clinical MR imaging to date, at 1.5 T or lower magnetic field strengths. There is lack of experience with use of field strengths greater than 2.5 T, and they should be avoided at present.

- If MRI cannot be performed (is contraindicated or not available), CT of the abdomen and pelvis should be used as a second-line test. The radiation dose to the foetus should be kept as low as possible (preferably below 50 mGy).

In our institution all pregnant patients requiring imaging undergo ultrasound examination in the first instance, followed by MRI if they are beyond the first trimester. CT is only used if MRI is contraindicated; the decision is made after discussion with obstetric team and the patient.

Examples of pregnant patients referred by Gynaecology and Pregnancy Services with suspected tumours.

Case 1 (Fig 1)

24/40 pregnant woman
ultrasound at 3\textsuperscript{rd} trimester revealed an ovarian cyst
- normal tumour markers
- previous history of borderline ovarian cyst
- MRI demonstrated a complex cyst

The patient went to term; surgery was performed post-partum.

\textit{Discussion}

Borderline ovarian tumour (BOT) represent approx. 5-10\% of all epithelial ovarian tumours. Their oncological behaviour and histological changes in the ovarian epithelium do not meet the specific criteria of benignity or malignancy and they are thought to have a low malignant potential [2].

The majority of the pregnant patients present with an asymptomatic adnexal mass discovered incidentally during a routine gynaecological review or an ultrasound scan performed for obstetric reasons (growth or anomaly scan). If symptomatic, the tumours present as any type of an adnexal mass with abdominal pain, changes in bowel habit or pelvic pain.

The most common sonographic finding in BTO, however not highly sensitive, is the presence of papillae within the cyst [3]. Much more sensitive and accurate is MRI which helps distinguish BOTs and other ovarian tumours [4].

Many believe that confirmed borderline ovarian tumours during pregnancy can be treated conservatively by salpingo-oophorectomy due to their good prognosis and a complete surgery can be deferred until after delivery [5]. There are, however a series of data, suggesting that some BOT diagnosed during pregnancy may have a higher incidence of aggressive features and conservative management may not be the best option of treatment [6]. Therefore, at present, no consensus has been reached regarding the management of BOTs during pregnancy.

Case 2 (Fig 2)

12/40 pregnant woman

\begin{itemize}
  \item Ultrasound at 12/40 suggested right adnexal mass
  \item Normal CA-125
\end{itemize}
• Follow up ultrasound at 17/40 - mass increased in size
• MRI at 17/40: degenerating subserosal fibroid

The patient went to term; surgery was performed post-partum.

Discussion

The majority of uterine fibroids do not demonstrate any significant change in volume during pregnancy [7, 8]. However, up to 30% may grow (mainly in the first trimester) and undergo degeneration as rapidly growing tissues outgrow the blood supply leading to tissue necrosis, and infarction. Patients with fibroids undergoing degeneration experience abdominal/pelvic pain, sometimes acute and suggestive of torsion.

Degenerating fibroids are best diagnosed on MRI where the location of the fibroids, their relation to ovaries and other abdominal structures as well as features suggestive of tortion can be easily detected.

Fibroids are rarely treated surgically in the first half of pregnancy. However, if necessary, several studies have reported that antepartum myomectomy can be safely performed in the first and second trimester of pregnancy [9, 10]. The main indications include severe pain from a degenerating fibroid especially if it is subserosal or pedunculated, a large or rapidly growing fibroid, or any large fibroid (above 5 cm) located in the lower uterine segment.

Case 3 (Fig 3)

Dermoid

20/40 pregnant woman

• Ultrasound at 20/40 suggested a large right echogenic adnexal mass
• Normal CA-125
• MRI features were consistent with a dermoid

The patient went to term; surgery was performed post-partum.

Discussion
Dermoid cysts of the ovary (mature cystic teratomas) are cystic tumours composed of well-differentiated elements from at least two of the three germ cell layers (ectoderm, mesoderm, and endoderm). They account for approximately 10% of all ovarian neoplasms [11] and are usually asymptomatic, unless large, when they may cause abdominal discomfort or pain.

Most mature cystic teratomas can be diagnosed on ultrasound, although they may have a variety of sonographic appearances, including a cystic lesion with a densely echogenic tubercle projecting into the cyst lumen (most common) or a diffusely or partially echogenic mass with the echogenic area usually demonstrating sound attenuation due to sebaceous material and hair within the cyst cavity [12]. MRI is the most useful modality in confidently diagnosing a dermoid cyst due to its high sensitivity to fat.

The course of pregnancy of patients with dermoid is favourable. The dermoids should be managed conservatively if possible with routine ultrasound follow up during the pregnancy since complications are extremely rare [13].

Case 4 (Fig 4)

Desmoid tumour of the abdominal wall

15/40 pregnant woman

- Slightly tender abdominal mass on examination
- No previous abdominal surgery
- Ultrasound: heterogeneous mass in the lower abdomen, difficult to establish its origin
- MRI at 18/20 demonstrated a fibrotic tumour arising from the left rectus sheath, confined to the anterior abdominal wall, no other foci of disease

The patient returned to her home country, no follow up available.

Discussion

The desmoid tumors are benign myofibroblastic neoplasms originating from the muscle fascia and aponeurosis with the most common site in the abdominal musculature, particularly in the rectus abdomini muscle. They represent approx. 3% of all soft tissue
tumours and less than 1% of all neoplasms. Despite their aggressive local infiltration, desmoid tumours lack a metastatic potential [14]. They may develop during or soon after pregnancy and present as an abdominal mass. Pregnancy-associated desmoid tumours are uncommon and optimal management of this tumour has not been yet established. Currently, opinions vary on the timing of surgical resection in view of potential for local growth and the effects on a gravid uterus [15].

On ultrasound desmoid tumours usually appear as well defined lesions with variable echogenicity. The lateral borders may be ill defined or irregular [16, 17].

MRI features are variable depending on the stage these tumours are imaged. Characteristic MRI findings include low signal intensity on T1-weighted sequences and heterogeneity on T2-weighted sequences with variable contrast enhancement. Low T2 signal intensity bands may be encountered and they represent foci of high concentrations of collagen deposition [16, 17].

Definitive diagnosis must be established with histopathologic analysis [16].

Case 5 (Fig 5)

26/40 pregnant woman

- Presented with abdominal pain
- Ultrasound revealed a mass adjacent to the gallbladder, the right ovary was not visualised
- MRI showed a large mass in the right upper quadrant; the right ovary was not seen separately form it, the possibility of torsion was raised
- Tumour markers were normal

The patient underwent surgery at 32 weeks - the histopathology revealed a Sertoli-Leydig tumour arising from the right ovary. The patient after surgery went to term.

Discussion

Sertoli-Leydig cell tumour of the ovary is a rare neoplasm that belongs to a group of sex cord-stromal tumours of the ovary and accounts for less than 0.5% of all primary ovarian neoplasms. Approximately 75% of Sertoli-Leydig cell tumours occur in patients younger than 30 years of age [18, 19]. The most common symptoms include: abdominal/pelvic pain (45%), palpable mass (30%), and virilisation [20].
Sertoli-Leydig cell tumours usually behave in a benign fashion; however up to 10%-18% of tumours may behave in a malignant manner with poorly differentiated tumours more likely to do so [18]. The majority of these tumours are diagnosed at an early stage and the patients can undergo unilateral adnexectomy. Foetal conservation surgery is always attempted. Most of the cases reported in the literature had live births at full term [20].

At imaging evaluation, Sertoli-Leydig cell tumours usually appear solid: ultrasound shows a well-defined hypoechoic mass and MRI a solid heterogenous mass with T2 signal intensity reflecting the content of fibrous stroma [21].
Images for this section:

**Fig. 1:** Borderline ovarian cyst (yellow arrows)

© Department of Radiology, Chelsea and Westminster Hospital, London, UK

**Fig. 2:** Degenerating fibroid (yellow arrows)

© Department of Radiology, Chelsea and Westminster Hospital, London, UK
Fig. 3: Dermoid (yellow arrow)

© Department of Radiology, Chelsea and Westminster Hospital, London, UK
**Fig. 4:** Desmoid tumour of the abdominal wall (yellow arrows)
© Department of Radiology, Chelsea and Westminster Hospital, London, UK

**Fig. 5:** Sertoli-Leidig tumour arising from the right ovary (yellow arrows)
© Department of Radiology, Chelsea and Westminster Hospital, London, UK
Conclusion

Establishing diagnosis and imaging in pregnant women with suspected tumours, both benign and malignant, is challenging and requires a close co-operation between radiologists, gynaecologists/obstetricians and often surgeons. Collecting and analysing data regarding these patients helps develop safe and reliable diagnostic and therapeutic pathways.

When it comes to imaging techniques, the modalities not involving ionizing radiation (ultrasound and magnetic resonance), are considered the first line of investigation. MRI should be avoided in the first trimester. Intravenous Gadolinium should not be used at any stage of pregnancy. CT should be used as the last resort after exploiting other diagnostic tools. The patients need to be informed about the safety and potential risks of all tests.
References


