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The management of ovarian pathology in pregnancy

Tommaso Bignardi, MD, Associate Lecturer *, George Condous, MRCOG, FRANZCOG, Associate Professor

Acute Gynaecology, Early Pregnancy, and Advanced Endosurgery Unit, Nepean Centre for Perinatal Care, Nepean Clinical School, University of Sydney, Nepean Hospital Penrith, Sydney, Australia

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The extensive use of ultrasound in early pregnancy populations has led to more ovarian lesions being diagnosed incidentally in asymptomatic gravid women. The majority of these lesions are physiological in nature and tend to resolve spontaneously as the pregnancy progresses. Expectant management or a "watch and wait" approach is the benchmark standard of care for a woman with an ovarian mass diagnosed during pregnancy. This approach assumes the woman is relatively asymptomatic, and the likelihood of malignancy is negligible. The prevalence of malignancy in pregnancy is rare indeed, i.e. 1 in 15,000–32,000. It is the discriminatory ability of ultrasound, in experienced hands, to distinguish between benign and malignant ovarian lesions that allow appropriate triaging during pregnancy. Discriminating benign from malignant masses is crucial not only to optimize the management of malignancies, but also to avoid unnecessary intervention that may adversely affect maternal or foetal outcomes. This review will focus on the management of ovarian masses in pregnancy.

For the purposes of this review, we define an ovarian/adnexal mass as an enlarged structure in the region of the pelvic adnexae that can either be palpated on examination or visualised using imaging techniques. Several conditions can be associated with an adnexal mass - these include malignancies arising from the ovary or the fallopian tube, metastatic disease from a different site (i.e. breast, gastrointestinal tract), as well as many benign pathologies.

* Corresponding author.
E-mail address: tommaso.bignardi@alice.it (T. Bignardi).

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Prevalence, etiology and natural history

We performed an electronic search in the database MEDLINE and a manual search of reference lists of review articles and original articles, using the keywords: "ovarian cysts", "adnexal masses" and "pregnancy". A summary of the relevant studies from this search is reported in Table 1.[1–20] Data about the prevalence of ovarian masses in pregnancy and the risk of malignancy are limited to retrospective cohort or population-based studies. Few studies are prospective longitudinal follow-up studies.[3–6,8] According to these studies, the prevalence of an ovarian mass in pregnancy varies between 0.19 and 8.8%. The prevalence of malignancy among ovarian masses diagnosed in pregnancy varies from 0 to 6.8%. Ovarian tumours of low malignant potential (LMP or borderline ovarian tumours) are usually considered as ovarian malignancy in these studies. As the frequency of ovarian cancer depends on age, the relatively low prevalence of cancer found in ovarian masses diagnosed in pregnancy reflects the younger age of the women studied compared with women around the time of the menopause and beyond, who are more commonly diagnosed with ovarian cancer. The reported prevalence ranges quite widely between studies. This may reflect differences in referral patterns and the nature of the

Table 1
Prevalence of ovarian masses and ovarian malignancies in pregnancy.

Author	Study type	Number of masses	Prevalence of ovarian masses	Deliveries	inclusion criteria	Prevalence of ovarian malignancies
Bernhard LM et al.[6]	Prospective study; ultrasound follow-up	422	**2.3%**	18,391	unilocular <5 cm; unilocular >5 cm or complex cysts	**N/A**
Schmeler KM et al.[13]	Retrospective analysis	63	**0.05%**	127,177	Any cyst >5 cm	**6.8%**
Bromley B et al.[3]	Prospective study; ultrasound follow-up	125	**N/A**	N/A	Any cyst >4 cm	**0.8%**
Duić Z et al.[14]	Case series	8	**0.05%**	16472	Persistent simple or complex cysts ≥6 cm; any mass with complication	**0**
Whitecar MP et al.[2]	Retrospective analysis	130	**0.08%**	1312	N/A	**6.1%**
Kumari I et al.[15]	Retrospective analysis	20	**0.12%**	16,260	N/A	**0.1%**
Hess LW et al.[1]	Case series	54	**0.08%**	1300	N/A	**5.9%**
Purnichescu V et al.[17]	Case series	21	**N/A**	N/A	Symptomatic or abnormal on scan	**0.05%**
Platek DN et al.[18]	Retrospective analysis	–	**0.07%**	43,372	Persistent simple or complex cysts ≥6 cm and	**0**
Zanetta G et al.[4]	Prospective study; ultrasound follow-up	79	**1.2%**	6636	Any cyst >3 cm	**3.6%**
Condous et al.[8]	Prospective study; ultrasound follow-up	161	**5.4%**	N/A	Any cyst >2.5 cm	**0.03%***
Glanc P et al.[19]	Retrospective analysis	–	**4.8%**	10830	Simple cysts ≥3 cm	**N/A**
Yen et al.[20]	Retrospective analysis	213	**N/A**	N/A	Any cyst ≥4 cm	**2.3%**
Leiserowitz GS et al.[9]	Retrospective population-based study	–	**0.19%**	4,846,505	N/A	**0.93%**
Lavery et al.[5]	Prospective study; ultrasound follow-up	–	**2.4%**	3,918	N/A	**N/A**
Ballard et al.[11]	Retrospective analysis	93	**0.17%**	55,271	N/A	**2.2%**
Czekierdowski et al.[10]	Prospective study; ultrasound follow-up	66	**2.94%**	N/A	Any cyst	**0%**
Mathevet et al.[12]	Case series	47	**N/A**	N/A	Symptomatic or abnormal on scan; persistent masses	**4.3%***
Moore et al.[16]	Case series	14	**N/A**	N/A	N/A	**0%**

In the series marked with an asterisk, all ovarian tumours detected were of low malignant potential (LMP or borderline ovarian tumours).