# Guideline for the management of ovarian cysts in children and adolescents

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# 1. PURPOSE OF THE GUIDELINE

The aim of this guideline is to provide guidance for medical staff who may be involved in the care of children or adolescents with ovarian cysts, to facilitate the appropriate management required.

# 2. BACKGROUND

Ovarian cysts in children are very common; the vast majority of them are benign and self-resolving, with less than 10% of these cysts being malignant [1]. Ovarian malignant tumours account for only 1% of all childhood cancers [2].

While there is a RCOG guideline for ovarian cysts in premenopausal women, there are no clear guidelines on the management of ovarian cysts in children; this appears to have led to over treatment of benign ovarian cysts, with often unnecessary surgery and multiple superfluous follow up scans.

The management of ovarian cysts in children and adolescents should include the participation of a gynaecologist with a specialist knowledge of paediatric and adolescent gynaecology to reduce the over treatment of benign ovarian cysts which may resolve spontaneously. Any surgery for ovarian cysts should be carried out by a gynaecologist with the appropriate surgical skills to reduce the need for an unnecessary laparotomy or oophorectomy. Ovarian Torsion is one of the only indications for immediate surgery and any other pathology can usually be discussed with a paediatric and adolescent gynaecologist prior to surgery.

# 3. RECOGNITION AND ASSESSMENT

## 3.1 Definition

A cyst is a fluid filled sac which is greater than 5cm, and so a 'cyst' which is less than 5cm should not be classified as a cyst, it is a normal physiological unless the child has not yet achieved menarche.

Ovarian cysts can be simple or complex.

A **simple** ovarian cyst is one which is unilocular and fluid filled, with no septations, solid areas or other features.

Simple cysts are most often a normal physiological finding which occurs due to the menstrual cycle. If no egg is released from a developing follicle, the fluid stays in the follicle and forms a cyst. This is called a follicular cyst. If the egg has been released a corpus luteum cyst can form. This type of cyst often contains a small amount of blood.

A **complex** cyst can be multilocular and will contain solid areas; examples include endometriomas and dermoid cysts. Complex cysts can have features suspicious of malignancy.

### 3.2 Symptoms and Signs

Many simple ovarian cysts are asymptomatic and only identified incidentally on ultrasound.

Larger ovarian cysts can cause pain and pressure symptoms. Torsion of a cyst will usually cause pain and present as an acute abdomen. In prepubescent girls, an ovarian torsion can occur without associated adnexal pathology.

### 3.3 Investigations

Ultrasound (USS) is the initial radiological investigation of choice preferably performed by a radiologist or radiographer with experience of gynaecological imaging.

Further investigations depend on the size and nature of the cyst.

All children and adolescents with an ovarian cyst should ideally be discussed with the gynaecological team

In the acute setting for example if an ovarian torsion is clinically suspected then the patient may need to go to theatre prior to further investigations. An USS in a pre-pubescent ovarian torsion will often show peripherally arranges follicles in addition to ovarian enlargement and oedema [3].

In the non-acute setting: If the child/young woman has achieved menarche then the following investigations apply [4]

| **Simple cyst <5cm** | **Simple cyst 5-7cm** | **Simple cyst >7cm** | **Complex cyst** |
|---|---|---|---|
| No Further investigation required | Yearly USS follow up | Consider MRI (or surgery) | Bloods –<br>LDH, HCG, AFP, Ca125<br>Discuss further imaging with radiology |

In any child who has not yet achieved menarche, then further follow up will be required for any size of cyst. These cases should be referred to, or at least have her management discussed with, a gynaecologist with specialist knowledge of paediatric and adolescent gynaecology.

### 3.4 Differential Diagnosis

Complex cysts can be either benign or malignant. Common examples include:

Benign

- Endometrioma

Pain is usually cyclical and may be associated with dysmenorrhea and dyspareunia (if sexually active).

- Dermoid (Mature cystic teratoma)

These tend to grow slowly and contain mature tissue. They can frequently contain clumps of hair, pockets of sebum, blood, fat, bone, nails, teeth, eyes, cartilage, and thyroid tissue.

Malignant – Germ cell tumours

- Dysgerminoma
- Endodermal sinus tumour (usually associated with a rise in APH)
- Embryonal carcinoma
- Choriocarcinoma (associated with a rise in HCG)

For all complex cysts, tumour markers are needed to rule out germ cell tumours, this should include CA125, AFP, LDH, CEA and hCG. It is ideal to discuss management of complex suspicious appearing cysts in the gynaecological oncology setting

## 4. MANAGEMENT

### 4.1 Conservative

A conservative approach is appropriate for asymptomatic simple ovarian cysts which are 5-7cm; these can be followed up with an annual USS [4] and the patient should be referred to the paediatric and adolescent gynaecology clinic to review the follow up ultrasound scan and organise on-going management.

Cysts that persist or increase in size are unlikely to be functional and may warrant surgical management and the patient should be referred to the paediatric and adolescent gynaecology clinic to decide upon further management.

Any cyst which is simple and less than 5cm, does not require any follow up unless the child has not yet achieved menarche. Girls who have no yet achieved menarche should be discussed with a paediatric gynaecologist regardless of the size of the cyst.

## 4.2 **Surgery**

The management of all children or adolescents with an ovarian cyst should be discussed with the gynaecology team prior to any surgical management. If an ovarian cyst is identified incidentally at the time of non-gynaecological surgery, a gynaecologist should be called before embarking on any surgery on the ovarian cyst.

Any surgery on adolescents should be carried out by a gynaecologist with the appropriate laparoscopic surgical skills to reduce the need for an unnecessary laparotomy or oophorectomy. This is of great importance as having laparoscopic surgery as opposed to a laparotomy will reduce post-operative pain, length of hospital stay and reduce the chance of adhesions [4].

Whatever type of surgery is performed all attempts should be made to save the ovary and perform a cystectomy rather than an oophorectomy. In children this is especially important as they require sufficient oestrogen for pubertal development as well as for future fertility.

Cystectomy is the operation of choice as drainage is associated with a high chance of recurrence and is therefore not recommended [4]. This is especially important for endometrioma as cystectomy has been showed to be to reduce the chance of recurrence of the endometrioma and also the recurrence of pelvic pain compared to drainage alone [5].

Laparoscopic cystectomy is also the treatment of choice for dermoid cysts/teratoma to preserve ovarian functions. Any inadvertent spillage should be efficiently cleared up with thorough irrigation and suction, with careful attention to ensure the paracolic gutters are clean and free of spillage. The risk of chemical peritonitis is less than 1% [6].

Teratoma/ dermoid cysts and endometriomata are conditions may be bilateral so preservation of ovarian tissue is essential in case they present in the future with a subsequent cyst on their contralateral ovary.

In ovarian torsion every effort should be made to save the ovary by untwisting the ovary and draining any cysts, a consultant with the relevant expertise should be involved. Even if the ovary appears black and necrotic in most cases the ovary will usually recover and result in a functional ovary

[7]. Cystectomy would be difficult in this situation due to the fragile tissues and can be carried out at an interval operation if required [3]. Oophoropexy remains controversial with limited long term data and is generally not recommended [3].

## 5. FOLLOW UP

All children and adolescents who are either diagnosed with an ovarian cyst (>5cm if a simple cyst) or who have surgical management of an ovarian cyst should be seen in the paediatric and adolescent gynaecology clinic even if it has not been possible for her to have been seem by a gynaecologist pre-operatively. This is to ensure the correct management is followed and allow counselling to the girl with regards to future fertility.

## 6. IN SUMMARY

1. Management of ovarian cysts in children and adolescents should include participation of a gynaecologist with a specialist knowledge of paediatric and adolescent gynaecology to try and reduce the over treatment of benign ovarian cysts which may resolve spontaneously.

2. Any surgery for ovarian cysts should be carried out by a gynaecologist with the appropriate surgical skills to reduce the need for an unnecessary laparotomy or oophorectomy.

3. Simple cysts <5cm do not require follow up unless the patient has not yet achieved menarche, as this will reduce parental anxiety.

4. All complex cysts should have tumour markers taken to rule out germ cell tumours.

5. All patients should be referred to the paediatric and adolescent gynaecology clinic as follow up after any surgery to an ovary or ovarian cyst.

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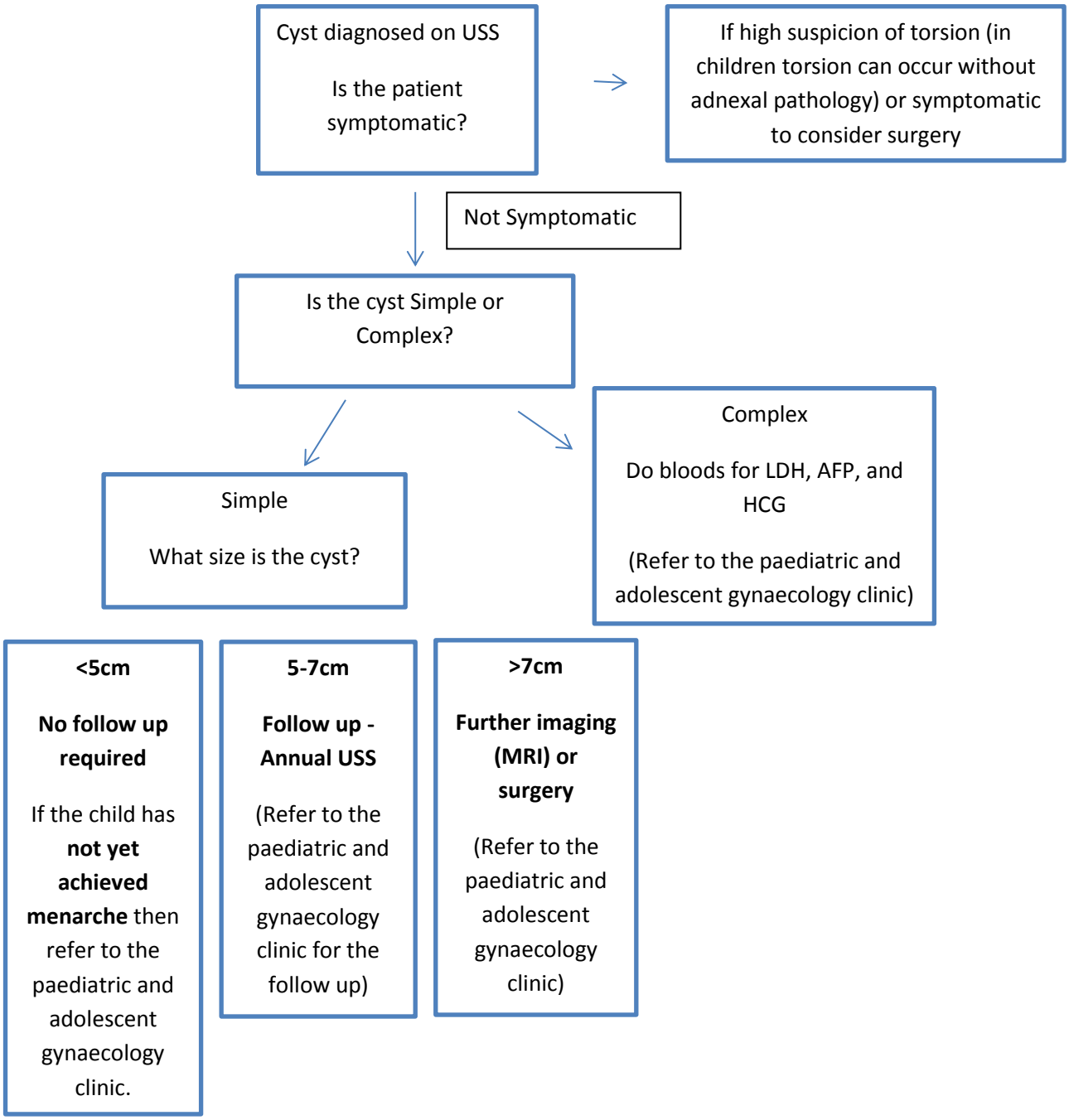
# Flow chart for cysts diagnosed on an Ultrasound scan.




**For cysts diagnosed at the time of surgery**

If an ovarian cyst is discovered incidentally at the time of surgery by a non-gynaecology speciality please seek advice from the gynaecology team before commencing any intervention on the ovarian cyst.