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Gynecology in Children and Adolescents

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INTRODUCTION

In this chapter the following common gynecological problems of children and adolescents will be described: fusion of the labia, vulvovaginitis, lichen sclerosus, condylomata acuminata, sexual abuse, prepubertal bleeding, abnormal bleeding after menarche, trauma and genital tumors. The chapter starts with history taking and examination of children and adolescents, and normal development.

HISTORY AND EXAMINATION IN CHILDREN AND ADOLESCENTS

History taking is the most important tool in children and adolescent gynecology. Approaches should be chosen according to the maturity of the child: in young children, history taking is done with the parents. Older children and adolescents may be able to describe their complaints themselves. The first contact with healthcare providers will set the tone for all future consultations: be patient, empathic and gentle and give the child the chance to be in control.

Examination of children can be done in several positions: frog-leg position in small children, on mother's lap for toddlers, on the side in knee-chest position, in lithotomy position for older adolescents. Start with general examination (height, weight, nutritional status) and examination of the abdomen (masses?) and inguinal area (possible hernias or gonadal masses?) and classify the breasts and pubic region according to Tanner to assess sexual development (Figure 1).

During inspection of the vulva look at the size and shape of the clitoris and labia, the presence of vaginal discharge, signs of trauma and lacerations, the hymen, pubic hair and hygiene. In case of

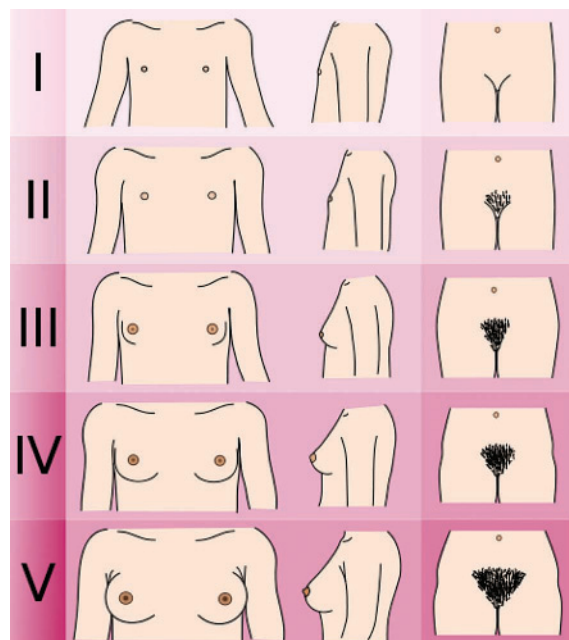


Figure 1 Stages of development according to Tanner. Illustration by Michal Komorniczak

vaginal discharge you can obtain a specimen with a cotton swab, an Öze or a small (neonatal feeding?) catheter. Make sure that during examination the mother or a chaperone is present.

In prepubertal and virgin children and adolescents, a vaginal examination is generally not indicated and if there is an indication, such as the suspicion of a foreign body, you may consider performing the speculum examination under general anesthesia using a nasal speculum (Figure 2). You may also consider performing a rectal examination or a rectal ultrasound as described in Chapter 1 in older adolescents who want to keep their virginity.

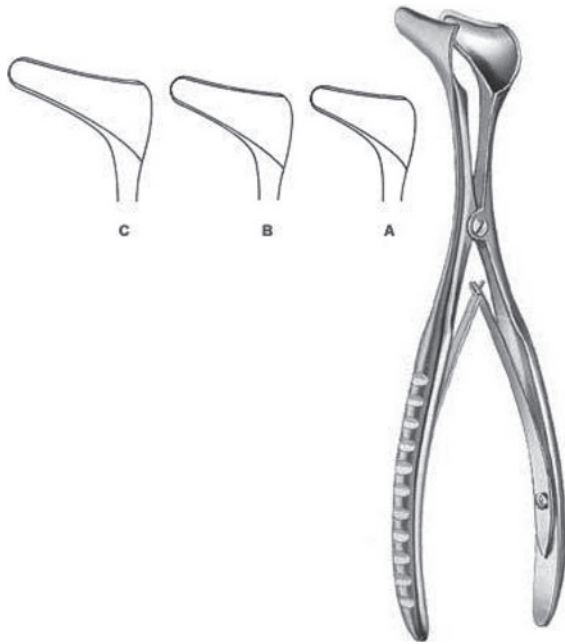


Figure 2 Nasal speculum can be used as vaginal speculum in children and young adolescents

NORMAL DEVELOPMENT AND MENARCHE

Puberty is defined as the period in which secondary sexual characteristics develop and is associated with a growth spurt and starts between 8 and 13 years and takes 3–4 years¹. Menarche is around 13.5 years but varies with region (see Chapter 8). During puberty various hormones cause secondary sexual characteristics: estrogens promote breast development, adrenal androgens promote the growth of pubic and axillary hair and pulsatile gonadotropin-releasing hormone (GnRH) secretion stimulates ovulation and menstruation¹. Usually pubic and axillary hair growth starts first (this is called pubarche), followed by breast development (thelarche) and then ovulation and last menstruation (menarche).

Early pubertal development

Early pubertal development can be isolated or general. Isolated forms of early development are early thelarche (isolated development of breasts starting from the age of 2 years is usually self-limiting and does not require treatment¹) or isolated early menarche (repeated vaginal bleeding in girls without secondary sexual characteristics is a

benign and self-limiting condition). Precocious puberty is defined as the presence of sexual characteristics in >2.5 standard deviations below average age¹ (around 6 years in African children) and may be idiopathic or due to intracranial, ovarian or adrenal tumors, or primary hypothyroidism.

Late development of puberty

Delayed puberty can be constitutional (ask for family history), due to chronic illnesses or malnutrition, gonadal dysgenesis like Turner syndrome (see Chapter 8) and congenital syndromes such as Kallmann's syndrome (see Chapter 8).

FUSION OF THE LABIA

In pre-pubertal children usually around the age of 3–5 years, low estrogen levels may cause the labia to fuse in the midline. The labia minora or majora are agglutinated to a variable degree from the tip of the clitoris to the posterior Fourchette². This may worry parents as they may think the child has no vagina. In the differential diagnosis you should consider: fusion of labia caused by female genital mutilation (FGM), lichen sclerosus, trauma or absent vagina and secondary healing or adhesive vulvitis may be seen. You can distinguish between fused labia and a congenitally absent vagina since the fused labia have the appearance of a flat perineum, with a fine line seen along the line of fusion, preventing visualization of the hymen, clitoris or urethral meatus in a child with fused labia (Figure 3)³. In a child with congenital absence of the vagina, the labia, clitoris and urethral meatus are easily identified and separation of the labia allows easy visualization of the hymenal orifice but no further inspection of the vagina⁴. Asymptomatic labial fusion does not need treatment as it will resolve spontaneously around puberty when endogenous estrogens are formed. Treatment in cases with symptoms such as urinary retention is topical estrogen cream twice daily for 2–6 weeks, or in cases of acute retention, surgical incision under general anesthesia. The fusion is likely to recur² after surgery and daily application of ointment such as Vaseline[®] to the labia once they are opened may be wise.

VULVOVAGINITIS IN CHILDREN AND ADOLESCENTS

Vulvovaginitis presents itself as vaginal discharge and/or itchy vulva and vagina. Urination can be



Figure 3 Labial fusion: please note that the clitoris, the labia minora and the hymen are not seen anymore. Source: Tsianos GI *et al.* Pyosalpinx as a sequela of labial fusion in a post-menopausal woman: a case report. *J Med Case Rep* 2011;5:546³

burning if lacerations are present. During history taking ask about duration, color, smell, quantity and consistency of the discharge, and about vaginal hygiene, itchiness, incontinence and nocturnal itchiness. Vulvovaginitis is a common complaint in children and adolescents and can be caused by several agents:

- Most frequent cause of vulvitis is *contact dermatitis*, for example by napkins or cleaning products. The child scratches a lot and may be unable to sleep at night. On examination, the labia majora are erythematous, scaly and often rugose due to lichenification. The labia minora may be involved with an increase in erythema and desquamation, giving the impression the child has vaginal discharge. Secondary infection with *Staphylococcus aureus* is possible². Recommendations to improve vaginal hygiene are: wear only cotton clothes, underwear or nappies. If possible do not wear underwear at night. Wash the vulva with clean water without soap. Wipe the vulva

after going to the toilet from front to back. Do not use soap etc. in the vulvar region.

- *Bacterial infection* is most common in girls between 2 and 7 years of age as they lack the protective effect of estrogens on the bacterial flora of the vulva and vagina⁴. The presenting symptoms are vaginal discharge, soreness, itchiness, burning, dysuria and redness of the vulva. On examination you may find marked vulvar and perianal inflammation with lichenification (Figure 4). You may consider taking a vulvo-vaginal swab and culture the microorganism. Treatment is difficult and the condition often recurs, but it will improve once the girl comes near puberty and estrogen production will increase or facilitate lactobacilli in the vagina and change the vulva and vaginal flora. Advice on recommendations to improve vaginal hygiene are as described above. When severe purulent infection does not resolve with these measures, consider amoxicillin, amoxicillin with clavulanic acid or metronidazole. Topical antibiotics and estrogens are not proven to be effective. Zinc oxide and castor oil may be prescribed to protect the damaged skin⁴. Parents may be anxious that their daughter is sexually abused. It is good to discuss this with them. During examination you should look for bruises and lacerations. A positive test result for sexually transmitted infections (STIs) (*Trichomonas*, *Chlamydia*, gonorrhoea) is suspicious for sexual abuse; however only 4% of abused girls show physical signs⁵.
- *Foreign bodies* can cause recurrent vaginal discharge. To establish the diagnosis do vaginal examination (use a nasal speculum or a hysteroscope or cystoscope in young children) under general anesthetic.
- *Enterobius vermicularis (threadworm)*: this intestinal worm causes nocturnal itchiness of the perineum, perianal region or vulva⁴ and is most frequently seen in toddlers and small infants. You can confirm the diagnosis by applying sticky tape on the perianal region at night and examine the sticky tape the next morning under a microscope (transfer the sticky tape on a microscope slide). Worms and ova are visible (Figure 5). Treatment is mebendazole stat according to the weight of the child (also treat the family).
- Vaginal discharge *in neonates* is physiological and caused by estrogens received from the mother prenatally. It is odorless and stops after a few

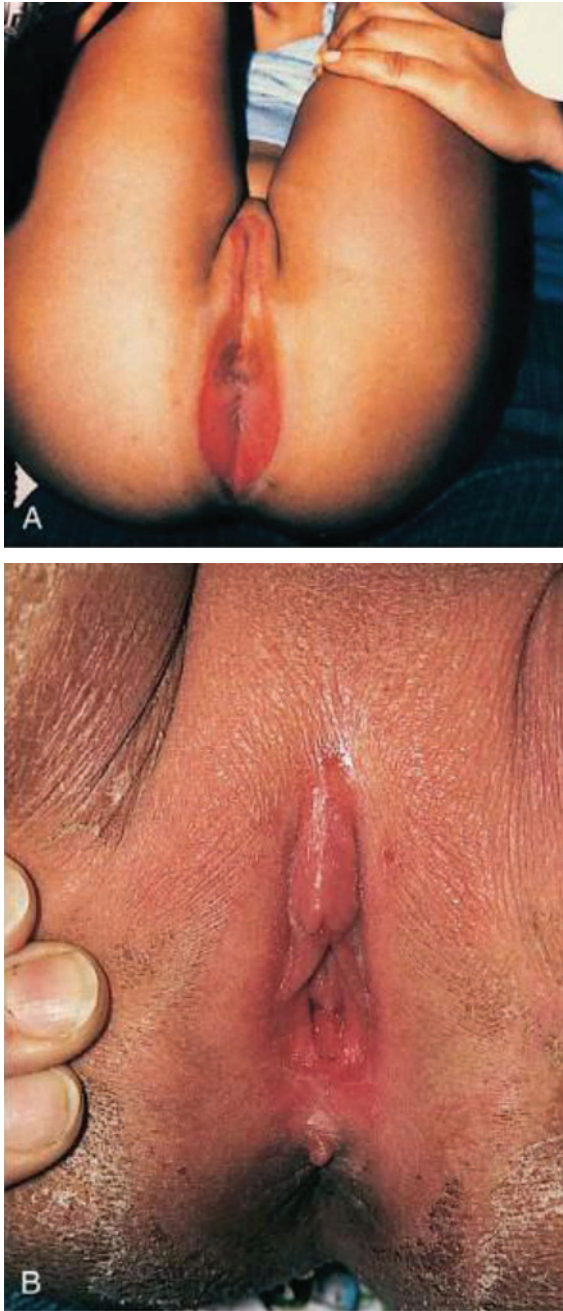


Figure 4 Vulvovaginitis in children: (a) redness and (b) lichenifications. Source: <http://health-7.com/imgs/17/3440.jpg>

weeks because the estrogen level drops. This decrease in estrogens may cause vaginal blood loss since the endometrium may be shed⁴.

- *Candida* is uncommon in pre-pubertal children, but is sometimes seen in children after a course of antibiotics, and in immunosuppressed children

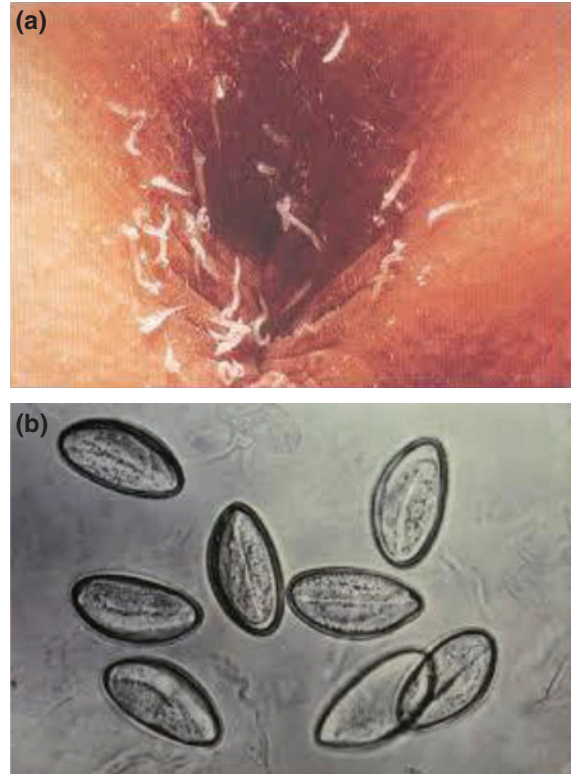


Figure 5 *Enterobius vermicularis* in the anal region of a child (a) and eggs seen under the microscope after a Scotch tape test (b)

and children wearing diapers. Treatment is miconazole ointment or vaginal capsule (Ovule).

LICHEN SCLEROSUS IN CHILDREN AND ADOLESCENTS

Lichen sclerosus is a chronic skin condition of unknown origin common in pre-pubertal girls (prevalence approximately 1 in 900) and postmenopausal women (prevalence 1 in 300–1000). It is a chronic skin condition of the ano-genital region but can also be present on other parts of the body. It presents with severe itchiness, skin soreness, discharge and sometimes with bleeding or chronic constipation.

Examination of the vulva shows the characteristic appearance of a hour-glass-shaped lesion around the vulva and anus with a white skin with loss of architecture (Figure 6). There are often associated areas of erosion, ulceration and purpura and, in severe cases, hemorrhagic bullae.

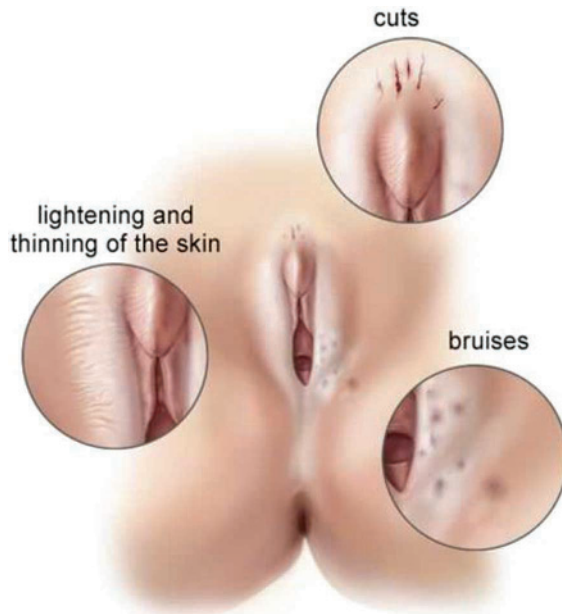


Figure 6 Lichen sclerosus in children. Source: <http://www.naspag.org/index.php/pagepediatricvulvar>

Biopsy is not usually required as the clinical appearances are diagnostic. Treatment is with potent topical steroids, such as clobetasol propionate 0.05%, applied twice daily for periods of up to 2 weeks, followed by application during three consecutive days a week followed by two consecutive applications per week and further by once weekly; it can even be stopped if symptoms allow. Please see <http://www.naspag.org/index.php/page-pediatricvulvar> for more information.

CONDYLOMATA ACUMINATA (GENITAL WARTS)

Before the age of 3 years genital warts are transmitted via mother-to-child transmission and are not a sign of sexual abuse. They are caused by a non-precancerous type of human papillomavirus (HPV). In 50% the warts disappear without treatment. Podophyllotoxin is contraindicated in children. Treatment in children is electrosurgical removal or cryotherapy of the warts.

SEXUAL ABUSE IN CHILDREN AND ADOLESCENTS

Sexual abuse in children and adolescents can be defined as any activity with a child before the age of legal consent that is for the sexual gratification of

an adult or a substantially older child⁵. UNICEF states that sexual violence against children is a gross violation of children's rights. Yet it is a global reality across all countries and social groups. It takes the form of sexual abuse, harassment, rape or sexual exploitation in prostitution or pornography. It can happen in homes, institutions, schools or workplaces, in travel and tourism facilities, and within communities – both in development and emergency contexts (http://www.unicef.org/protection/57929_58006.html).

Child sexual abuse is outlawed nearly everywhere in the world, generally with severe criminal penalties. The exact incidence of sexual abuse in children and adolescents is unknown, but in a South African study forced sexual initiation was reported by 'almost a third' of adolescent girls⁶. The number of children involved in child prostitution is unknown, but between 1 million and 10 million children are estimated to be involved.

Sexual abuse and prostitution of children and adolescents are a tragedy for any child or young person since it is psychologically and physically very damaging and may threaten their lives (either by physical abuse or with diseases like HIV). They can be damaged by it for the rest of their lives as they are robbed of their childhood experience, self-esteem and opportunities for good health and education⁷.

Healthcare providers may be confronted with an abused child and can play a key role in signaling child abuse. Physical examination of a sexually abused child is challenging since the (damaged) child needs to trust the (adult) examiner. On physical examination of an abused child you may find subtle signs and symptoms and you should be familiar with normal children and adolescent anatomy to appreciate these changes. One study reports that in only 4% of the abused children are physical signs visible. Findings after penetration are tearing or transection of the hymen fossa or Fourchette. STIs may be present in the vagina, vulva (on culture) and/or anus (*Neisseria gonorrhoeae*, and deep lacerations to the anal sphincter are considered 'diagnostic' of penetration by an object). But be careful: obstipation or self-introduction of objects can also cause anal lacerations. Healing of a vaginal/hymenal tear may be complete or result in hymenal clefts or V-shaped notches that approach the floor of the vulva below 3–9 o'clock; 77% of experts judge this finding to be due to possible trauma or sexual contact⁵.

Prevention of child abuse can start from different levels: at mother and child health (MCH) clinics, during education in schools, on television, internet and during community sensitization. Early detection should be done during MCH, in schools and in out-patient departments. Particular attention should be given to children with developmental, behavioral, or medical problems, who may be at increased risk of abuse⁵. Healthcare providers should be aware of the fact that recognizing and reporting child sexual abuse, or tertiary prevention (to prevent recurrent abuse in an already abused child), is the most effective means of prevention of re-abuse⁵. Several countries have policies on children and adolescent abuse; please make yourself familiar with them.

PRE-PUBERTAL VAGINAL BLEEDING

The incidence of pre-pubertal vaginal bleeding is low; however, as serious causes can underlie the problem, it is important to examine the girl. Frequently, no cause can be identified. Common causes of pre-pubertal vaginal bleeding are:

- *(Recurrent) vulvo-vaginitis* (see earlier section in this chapter).
- *Introduction of a foreign body* is another common cause of pre-pubertal vaginal bleeding and is often associated with vaginal discharge. To detect foreign bodies you can perform an (rectal) ultrasound using the vaginal probe (in a larger child) or perform an examination under anesthesia using a nasal speculum, a hysteroscope or cystoscope (if available).
- *Neonatal estrogen withdrawal bleeding* occurs in the first 2 weeks of life and is regarded as physiological.
- *Prolapsed urethral orifice* This is not an uncommon problem in girls around the age of 5 years. A short-term course of topical estrogen ointment (possibly combined with topical antibiotic cream) is the treatment of choice.
- *Precocious puberty* (see above).
- *Hormone-producing tumors* such as granulosa cell tumors of the ovary: the incidence of this estrogen-producing tumor peaks at the age of 50–54 years of age, but 5% of granulosa cell tumors are juvenile. Treatment is surgical, preferably fertility sparing (peritoneal washings, unilateral oophorectomy, lymph node sampling, peritoneal biopsies and omentectomy; see Chapter 28)

- *Vaginal or cervical tumors* such as embryonal rhabdomyosarcoma, clear cell carcinoma of the vagina, or mesonephric carcinoma are extremely rare. They may present with intermittent vaginal bleeding, sometimes associated with the passage of tissue. Diagnosis is made by examination under anesthesia and biopsy for histological examination. Rhabdomyosarcoma is a fast-growing aggressive malignancy of the submucosa of the vagina; 90% of the girls who are affected are below the age of 5 years and signs and symptoms are a mass protruding from the vagina accompanied by bleeding. Treatment should be performed by experienced oncologists/pediatric surgeons/gynecologic oncologist and consists of chemotherapy, surgery and possibly radiotherapy.

MENORRHAGIA AROUND MENARCHE

Menstrual disorders around menarche are common and are caused by anovulation due to an immaturity of the hypothalamic–pituitary–ovarian axis and may last around 12–18 months. In the first periods after menarche, the endometrium lacks the stabilizing effect of progesterone and heavy bleeding may occur during this period.

Disorders that should be ruled out are: pregnancy-related complications, bleeding disorders (platelet function abnormalities and von Willebrand disease are the most common), STIs, hypo- and hyperthyroidism, ovarian tumors and endometrium polyps. If possible do a transrectal ultrasound (see Chapter 1).

In anovulatory cycles, reassurance of the patient and her family about the self-limiting nature of the bleeding disorder is necessary: as soon as ovulation starts the bleeding problem will diminish. When anemia is only mild, treatment is not necessary but the girl should keep a bleeding calendar and return to the clinic for evaluation and follow-up. Administration of combined oral contraceptives (COC) in these girls may prolong the episode of heavy menstruation as the endometrium can become more atrophic. Prescribe iron tablets if the girl has a low Hb. In severe bleeding disorders, the following treatment may be considered: blood transfusion, non-steroidal non-inflammatory drugs (NSAIDs), tranexamic acid and hormonal therapy (COC) in a high dose for 5 days according to the schedules in Chapter 20⁸.

TRAUMA

Commonly, pediatric traumas are classified as straddle injuries (blunt, not penetrating) and penetrating injuries. In straddle injuries the labia are swollen and hematoma may be present. Please check whether the child is able to urinate spontaneously or whether you need to catheterize. When the urine is blood stained consider cystography to rule out bladder and urethra injury. If you need to catheterize, leave the indwelling catheter in for some days until the swelling diminishes. When you are not able to introduce the catheter, you may consider doing an examination under general anesthesia. Consider analgesics and prophylactic antibiotics. Seldom will you need to explore the bleeding in order to stop it or to give the child a suprapubic catheter.

Accidental penetration trauma happen when a child falls on a sharp object and after serious sexual child abuse. History taking is essential. Always consider injury of the rectum or bladder or even an intra-peritoneal lesion. Do a careful examination under anesthesia. If you consider serious damage of organs the child may need cystography or cystoscopy, recto-sigmoidoscopy, laparoscopy (where available) or even laparotomy. Please refer the patient to an appropriate setting if indicated.

GENITAL TUMORS

Common malignant genital tumors in children and adolescents

- Germ cell tumors are the most common ovarian malignancies in girls. They present as pelvic mass. Diagnosis and treatment are described in Chapter 28.
- Granulosa cell tumors are the second common ovarian malignancy and are more often presenting as an abdominal mass with vaginal bleeding caused by estrogen production of the tumor (Chapter 28).

Common benign genital tumors in children and adolescents

- Mature teratoma (dermoid cysts) (see Chapter 11).

- Simple epithelial cysts (cystadenomas) (see Chapter 11).
- In McCune–Albright syndrome a hormonally active cyst in the ovary is present causing uterine bleeding. Ovarian masses in children and adolescents often present with increasing abdominal girth and/or abdominal pain. Many simple cysts without signs of malignancy (see Chapter 1 on ultrasound) can be managed conservatively, except if signs of torsion are present. This is an emergency that needs laparoscopy (where available) or laparotomy as soon as possible. If possible surgery in girls should be fertility sparing. Even if during laparotomy you find an adnexal mass livid and edematous you should try to detorque it and allow recirculation before you perform an adnexectomy in a young patient as the potential for recovery is good. Try to fixate the ovary to prevent re-torsion. A solid ovarian mass in childhood is considered malign until histologically proven otherwise.

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