Ashford and St. Peter's Hospitals
NHS Foundation Trust

Common Surgical Problems in Infancy

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Guideline History		
Date	**Comments**	**Approved By**
20/09/2021	First ratified	Paediatric Guideline Committee

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Common Surgical Problems in Infancy

Introduction

An overview of 4 common surgical problems seen in infants in clinic and how to manage them.

a. Hydrocele

b. Inguinal Hernia

c. Undescended testes

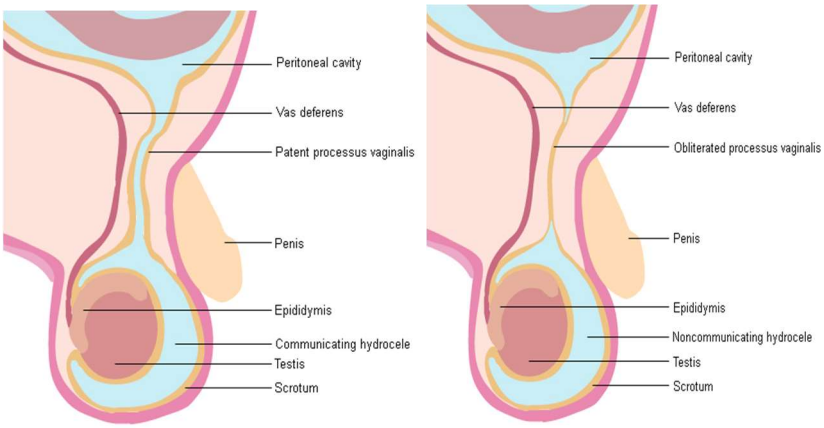
d. Umbilical hernia

Hydrocele

Background

A collection of serous fluid within the tunica vaginalis that surrounds the testes. Rarely, females can develop similar fluid collections along the canal of Nuck. Two types of hydroceles occur: communicating and non-communicating (simple).

In communicating hydroceles, a patent processus vaginalis allows peritoneal fluid to flow freely between both structures. If large enough, an Inguinal Hernia can occur with abdominal organs descending into the inguinal canal or scrotum. A non-communicating/simple hydrocele occurs when the processus vaginalis is closed but more fluid is being produced by the tunica vaginalis than is being absorbed. Likely an older child. Can be secondary to trauma, torsion, epididymitis, post repair.



History

Scrotal swelling that is fluctuant, asymptomatic, and painless, that is usually noticed by carers. Usual to have variation / enlargement of scrotal mass during the day. If painful, the possibility of an incarcerated or strangulated inguinal hernia must be considered. Sudden distension of a hydrocele can also cause pain. No history of reducibility if non-communicating. Occasionally present on both sides

Physical Examination

Palpation - Use index finger and thumb to palpate the lump superiorly. You will be able to get above a hydrocele (spermatic cord can be felt above the hydrocele), while a hernia is continuous with the patent processus vaginalis.

Trans-illumination: Hydroceles will trans-illuminate. Also Note: Inguinal hernia in premature infants can also trans-illuminate.

Investigations

Most cases of can be diagnosed with a good history and adequate physical examination alone. A minority of patients require Ultrasound to confirm the diagnosis if uncertain

Management

Reassure parents that the hydrocele (around 90%) is likely to resolve without treatment by 2 years of age. Progression to hernia is rare and does not result in incarceration

In late-onset hydrocele presenting >1yr, (suggestive of a non-communicating hydrocele) there is still a reasonable chance of spontaneous resolution (75%) and expectant management of six to nine months is recommended.

Refer to a Paediatric Urology surgeon if:

• Hydrocele is still present after 1 year of age.

• Concomitant inguinal hernia is suspected

• Hydrocele is localised to the spermatic cord.

Referrals

Mr Murphy (Paediatric Urologist at SGH) – Referral Letter (Joint SGH/ASPH clinic)

Parent Leaflet

https://media.gosh.nhs.uk/documents/Inguinal_hernias_F0676_A4_bw_FINAL_Mar12.pdf

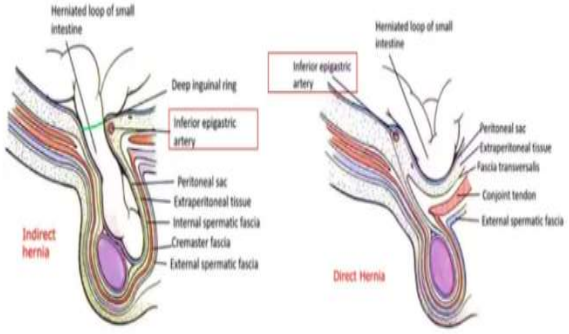
Inguinal Hernia

Background
About 1-5% of healthy, full-term babies may be born with an inguinal hernia.

Indirect inguinal hernias occur when bowel enters the inguinal canal through a patent processus vaginalis. This is the most common type seen in children. Right sided hernias are more common than left. Direct inguinal hernias emerge directly through the floor of the inguinal canal. These are rare in children. 15% are bilateral (positive family history).

Increased Incidence

- Male
- Preterm infants (10-30%)
- Low birth weight (<1kg)
- Abdominal wall defects (Prune belly syndrome)
- Connective tissue disorders (Ehlers Danlos)
- Chronic respiratory disease
- Undescended testes
- Increased intra-abdominal pressure
- Family history (bilateral)



History:

A hernia will be reported as a swelling or bulge, seen in the inguinoscrotal region in boys and inguino-labial region in girls. In many cases the swelling may only be seen intermittently, during crying or straining. Commonly, no pain is associated with a simple inguinal hernia in an infant, although parents may perceive the bulge as being painful. If there is pain, suspect an incarcerated inguinal hernia and refer urgently.

Examination:

Examine in both supine and standing positions. Typically reveals a palpable smooth mass originating from the external ring lateral to the pubic tubercle. The mass may only be noticeable after coughing or performing a Valsalva manoeuvre, and it should be easily reducible. Occasionally, loops of bowel can be felt within the hernia sac. In girls, feeling the ovary in the hernia sac is not unusual and can be confused with an inguinal lymph node.

In boys, palpation of both testes is important to rule out undescended or retractile testes.

Investigation

Diagnosis is clinical, although US can play a role in older children with indeterminate pain.

Management

Surgery is indicated for all paediatric patients with inguinal hernia. If a patient presents with incarceration, an attempt at reduction should be made and urgent surgery is required, as the risk of reincarceration is as high as 15% if surgery is delayed more than 5 days.

Refer at diagnosis to Paediatric Surgeon as semi-urgent surgery is usually performed to prevent the theoretical risk of incarceration. Risk of incarceration is high in early infancy, premature infants and females.

Referrals

Mr Okoye /Mr Rex (Paediatric Surgical Consultants) – Referral Letter - Joint Clinic SGH/ASPH

Parent Leaflet

https://media.gosh.nhs.uk/documents/Inguinal_hernias_F0676_A4_bw_FINAL_Mar12.pdf

Undescended testes

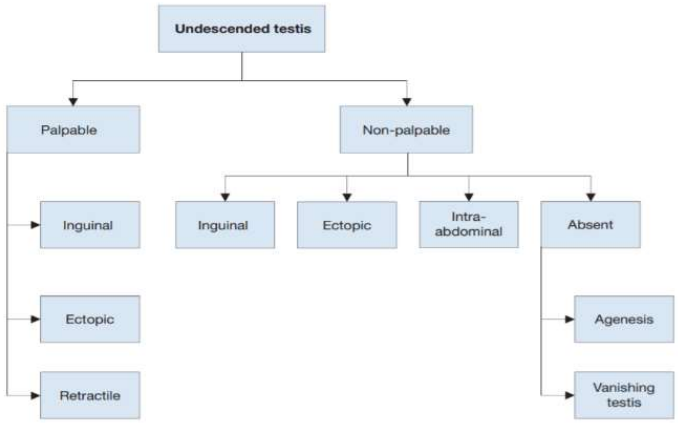
Background

Cryptorchidism is the most common genital problem encountered in paediatrics. 3% of full-term male newborns have cryptorchidism. Subsequent descent reduces prevalence of cryptorchidism to 1% by 6m – 1yr of age.

30% cases are bilateral

Types :

Figure 1: Classification of undescended testes



Palpable testes (80%) :

- Undescended Testes (arrested descent) – Due to anatomical abnormality or hormone deficiency/resistance. Most undescended testes migrate into the lower scrotum within the first three months of life, presumably as a consequence of a postnatal testosterone surge.
- Ectopic testes: exit the external inguinal ring and are then misdirected from the normal course. Usually superficial inguinal pouch, can be perineal, abdominal, pelvic, crural, penile and femoral.
- Retractile testes: may be palpated anywhere along the natural course of the testis, although most are inguinal. These testes can be manipulated into the scrotum, where they remain without tension. Due to an overactive cremasteric reflex

Non-palpable testes (20%): either intra-abdominal (50-60%) or absent/atrophic

Predisposing factors:

Prematurity (30% prevalence), low birth weight, small size for gestational age and familial predisposition. Syndromes (Prader-Willi, Kallmann's syndrome, Laurence-Moon syndrome. Intersexuality/congenital adrenal hyperplasia, Prune belly syndrome)

Examination:

The child is placed supine, in a frog-legged position, and the examiner uses a gentle palpation technique with warm hands. A bimanual technique is used, with the nondominant hand gently milking or sweeping down the testis along the inguinal canal and the other hand palpating the scrotum and groin to identify the testis.

An undescended testis cannot be manipulated into the scrotum despite gentle traction or milking of the gonad during examination of a relaxed child. In contrast, a retractile testis can be brought down to the scrotum in a relaxed baby by gentle traction and it usually stays in the scrotum for a short duration once released.

Hemiscrotum on the side of the undescended testis appears poorly developed and has fewer rugae than a hemiscrotum with a descended testis

Investigations:

Clinical examination remains the key diagnostic tool. Ultrasonography is not recommended, as it lacks sufficient sensitivity and specificity.

Management

Refer if testes have not descended at 6 months of age. Orchidopexy to be carried out by 12 - 18 months of age, to maximize fertility potential and to prevent loss of germ cells.

Retractile testis can be followed up without surgical intervention, with an annual physical examination till puberty, to establish whether the testis remains retractile or that it has descended or that it has secondarily become an undescended testis.

In newborns with non-palpable or undescended testes on both sides and any sign of disorders of sex development (DSDs) such as concomitant hypospadias, urgent endocrinological and genetic evaluation is required

Referral

Mr Murphy (Paediatric Urologist at SGH) – (Joint Clinic SGH/ASPH)

Endocrine - https://onlinelibrary.wiley.com/doi/epdf/10.1111/cen.14528

Parent Leaflet

https://media.gosh.nhs.uk/documents/Undescended_testicles_F0599_A4_bw_FINAL_Jul16.pdf

Umbilical hernia

Background

Umbilical hernia is one of the most common paediatric surgical conditions, affecting 1 in 5 babies. It occurs because of failure of cicatrisation of the umbilical ring following separation of the umbilical cord – allows the peritoneum (with or without intestine) to bulge through the abdominal wall at the base of the navel.

It is important to differentiate true umbilical hernia from paraumbilical and supraumbilical hernias since the latter groups will not disappear spontaneously.

History

Umbilical swelling which increases in size on crying/straining. Older children may get intermittent discomfort indicating intermittent obstruction.

Predisposing factors:

Associated with premature infants, low birth weight, Afro-Caribbean ethnicity, infants with Down's syndrome, and boys more than girls

Examination

Abdominal examination reveals a fascial defect at the umbilicus, with intact overlying skin, with an easily reducible hernia. Incarceration (Pain, redness and tenderness) is rare in children and usually involves the small bowel, resulting in obstructive symptoms such as vomiting, abdominal pain, and constipation.

Management

Parental reassurance about the high probability of spontaneous closure and rarity of incarceration.

80-90% of umbilical hernias will have closed by the time the child is 3 years of age. The time taken to close depends on the size of the defect, with 95% of umbilical hernias less than 0.5 cm in diameter closing by the age of 2 years.

Refer to paediatric surgeon if umbilical hernia is still present at 3 years of age.

Repair can be offered for paraumbilical and supraumbilical hernias on a routine non-urgent basis, as this type of hernia will not resolve itself.

Refer : Mr Okoye/ Mr Rex Paediatric Surgical Consultants at SGH (Joint SGH/ASPH)

Resources

https://media.gosh.nhs.uk/documents/Umbilical_and_epigastric_hernias_F1150_A4_bw_FINAL_Jul16.pdf

2. Supporting References

1. Birmingham Outpatient Guidelines https://bwc.nhs.uk/download.cfm?doc=docm93jijm4n3110.pdf&ver=4641)
2. EAU Guidelines: Paediatric Urology | Uroweb. https://uroweb.org/guideline/paediatric-urology/
3. https://bestpractice.bmj.com/topics/en-us/1104
4. International Pediatric Endosurgery Group. IPEG Guidelines for Inguinal Hernia and Hydrocele. J Laparoendosc Adv Surg Tech A. 2010 Mar;20(2):x-xiv. https://pubmed.ncbi.nlm.nih.gov/20230241/
5. Bowling, K., Hart, N., Cox, P., & Srinivas, G. (2017). Management of paediatric hernia. *BMJ*, j4484. https://www.bmj.com/content/359/bmj.j4484.abstract
6. UK Guidance on the Initial Evaluation of an Infant or an Adolescent with a Suspected Disorder of Sex Development https://onlinelibrary.wiley.com/doi/epdf/10.1111/cen.14528

3. Supporting relevant trust guidelines

2. Guideline Governance

a. Scope

This guideline is relevant to all staff caring for all children from 0-18 years old across the emergency department, inpatient ward and outpatient department.

b. Purpose

i. This guidelines aims to facilitate a common approach to the management of children. At times deviation from the guideline may be necessary, this should be documented and is the responsibility of the attending consultant.

ii. This guideline is subject to regular review to ensure ongoing evidence based practice.

c. Duties and Responsibilities

All healthcare professionals responsible for the care of all children 0-18years should be aware of practice according to this guideline.

d. Approval and Ratification

This guideline will be approved and ratified by the Paediatric Guidelines Group.

e. Dissemination and Implementation

i. This guideline will be uploaded to the trust intranet 'Paediatric Guidelines' page and thus available for common use.
ii. This guideline will be shared as part of ongoing education within the Paediatric Department for both medical and nursing staff.
iii. All members of staff are invited to attend and give comments on the guideline as part of the ratification process.

f. Review and Revision Arrangements

a. This policy will be reviewed on a 3 yearly basis by the appropriate persons.
b. If new information comes to light prior to the review date, an earlier review will be prompted.
c. Amendments to the document shall be clearly marked on the document control sheet and the updated version uploaded to the intranet. Minor amendments will be ratified through the Paediatric Guidelines Group. A minor amendment would consist of no major change in process, and includes but is not limited to, amendments to documents within the appendices.

g.

h.

i. Equality Impact Assessment

Background • Who was involved in the Equality Impact Assessment
Dr Asma Azmatullah and Dr Alison Groves
Methodology • A brief account of how the likely effects of the policy was assessed (to include race and ethnic origin, disability, gender, culture, religion or belief, sexual orientation, age) • The data sources and any other information used • The consultation that was carried out (who, why and how?)
All groups of staff and patients were taken into consideration and there is no bias towards or against any particular group.
Key Findings • Describe the results of the assessment • Identify if there is adverse or a potentially adverse impacts for any equalities groups
There is no evidence of discrimination.
Conclusion • Provide a summary of the overall conclusions
There is no evidence of discrimination.
Recommendations • State recommended changes to the proposed policy as a result of the impact assessment • Where it has not been possible to amend the policy, provide the detail of any actions that have been identified • Describe the plans for reviewing the assessment
This guideline is appropriate for use.

j. Document Checklist

To be completed (electronically) and attached to any document which guides practice when submitted to the appropriate committee for approval or ratification.

Title of the document:

Policy (document) Author:

Executive Director: N/A

		Yes/No/ Unsure/NA	Comments
1.	**Title**		
	Is the title clear and unambiguous?	**Y**	
	Is it clear whether the document is a guideline, policy, protocol or standard?	**Y**	
2.	**Scope/Purpose**		
	Is the target population clear and unambiguous?	**Y**	
	Is the purpose of the document clear?	**Y**	
	Are the intended outcomes described?	**Y**	
	Are the statements clear and unambiguous?	**Y**	
3.	**Development Process**		
	Is there evidence of engagement with stakeholders and users?	**N/A**	
	Who was engaged in a review of the document (list committees/ individuals)?		**Paediatric Guidelines Committee** **Mr Rex, Mr Murphy**
	Has the policy template been followed (i.e. is the format correct)?	**Y**	
4.	**Evidence Base**		
	Is the type of evidence to support the document identified explicitly?	**Y**	

		Yes/No/ Unsure/NA	Comments
	Are local/organisational supporting documents referenced?	**Y**	
5.	**Approval**		
	Does the document identify which committee/group will approve/ratify it?	**Y**	
	If appropriate, have the joint human resources/staff side committee (or equivalent) approved the document?	**N/A**	
6.	**Dissemination and Implementation**		
	Is there an outline/plan to identify how this will be done?	**Y**	
	Does the plan include the necessary training/support to ensure compliance?	**Y**	
7.	**Process for Monitoring Compliance**		
	Are there measurable standards or KPIs to support monitoring compliance of the document?	**N/A**	
8.	**Review Date**		
	Is the review date identified and is this acceptable?	**Y**	
9.	**Overall Responsibility for the Document**		
	Is it clear who will be responsible for coordinating the dissemination, implementation and review of the documentation?	**Y**	
10.	**Equality Impact Assessment (EIA)**		
	Has a suitable EIA been completed?	Y	

Committee Approval (Paediatric Guidelines Group)			
If the committee is happy to approve this document, please complete the section below, date it and return it to the Policy (document) Owner			
Name of Chair	**Dr Claire Mitchell**	**Date**	**23/09/2021**
Ratification by Management Executive (if appropriate)			
If the Management Executive is happy to ratify this document, please complete the date of ratification below and advise the Policy (document) Owner			
Date: n/a			