Paediatric Diagnoses & Treatments

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Appendicitis

Appendicitis is a common cause of significant abdominal pain in children.

Usually starting as general or central abdominal pain, it tends to become more apparent in the lower, right corner of the abdomen after 6-18 hours. There is often, associated lack of appetite with nausea and sometimes one or two vomits. The children can become dehydrated with a fast heart rate. They are often pale, but can become flushed if perforation has occurred.

Children with appendicitis often have a low grade temperature initially, but if perforation has occurred, then a high temperature will develop.

In Appendicitis, the abdomen is usually very tender to touch in the lower, right corner of the abdomen and hopping on the right leg worsens the pain significantly.

Unfortunately, perforation of the appendix is more common and occurs sooner in the younger children.

If antibiotics have been given for an alternative diagnosis, then the diagnosis of appendicitis may be delayed and an inflammatory mass may develop. An inflammatory mass would require a further 5 days of intravenous antibiotics in hospital and the appendix would need to be removed at a later date.

Many viral illnesses can cause abdominal pain and tenderness, but these will often result in a high temperature initially with other possible symptoms such as a headache or a sore throat.

In some situations, the diagnosis of appendicitis may not be immediately evident. Ultrasound and blood tests may be necessary to help with making the diagnosis and occasionally a CT scan might be performed. A period of observation in hospital can be useful in the earlier stages of the symptoms. With intravenous fluids and pain relieving medication, the symptoms associated with viral illnesses will subside.

Treatment

Appendicectomy should be performed as soon as possible after the diagnosis has been made by a specialist childrens surgeon. This may be performed laparoscopically or open if appropriate.

If perforation has occurred, then a further 5 days of intravenous antibiotics will be necessary.

It is rare for hospitalisation to extend beyond 6 days and if recovery has not occurred by this time, then it is likely that there is a complication such as further infection within the abdomen.

Depending upon the severity and length of the illness, convalescence at home may take up to a month. If appendicitis is caught early enough, then after appendicectomy, the child may be discharged from hospital after 24 hours and may be back at school within the week.

Circumcision

Circumcision is an operation which is performed to remove the foreskin.

Who needs a circumcision?

The medical indications for performing a circumcision include a tight foreskin or phimosis with associated scarring that prevents the foreskin from being completely pulled back, or recurrent, severe infections of the penis and foreskin. Circumcisions may also be performed for social and religious reasons.

When should this be performed?

If possible, circumcision is performed when the child is over one year of age. Circumcision of the newborn should be avoided, as there is a significantly increased risk of complications in this age group. These complications include narrowing of the urinary opening due to scarring.

Circumcision is usually performed as a daycase operation. Under a general anaesthetic, the foreskin is removed using either scissors or a scalpel. The edges of the skin are then stitched together using stitches that dissolve of their own accord after 1-2 weeks. Whilst the child is asleep, the anaesthetist will block the nerves to the penis with an injection of local anaesthetic. After the child has woken, he should not be in significant pain but may be distressed at waking in a strange place, and feeling hungry. The anaesthetic injection tends to last for about 6-8 hours and after this time the boy may require oral pain killers for 1-2 days. If it is comfortable to do so, the boy can bath or shower normally, even on the first day.

Can there be complications after the operation?

The two main side effects of the operation are bleeding and infection. If bleeding from the edges of the cut become a trickle, then the Paediatric Surgeon will need to review the child again and occasionally may need to return the child to the operating theatre to stop the bleeding. If infection occurs, it is usually 2-3 days after the operation and the penis will become more swollen, more red and more painful rather than less so. If this occurs, the boy may require a course of antibiotics. Sometimes the edges of the cut will stick to the head of the penis and will require gentle separation in the clinic some weeks after the operation.

If a child has a slightly abnormal penis and foreskin, a Paediatric Surgeon must exclude the possibility of hypospadias before a circumcision is performed. Hypospadias is a congenital abnormality of the penis in which the opening for the urine is not located at the tip of the penis. There is an associated hooding of the foreskin, there may be curvature of the penis and sometimes the urinary opening is smaller than it should be. As the foreskin is useful in the correction of Hypospadias, it should be preserved in the boys with this abnormality.

It is important that circumcision achieves a cosmetically and functionally appropriate result with the correct amount of foreskin removed during the operation.

Gastro-Oesophageal Reflux (GOR)

The majority of new born babies have a degree of gastro-oesophageal reflux which may be obvious with vomiting, or silent with arching of the back when feeding, irritability or so called "colic" type symptoms.

Smaller, more frequent feeds and keeping the babies relatively upright throughout the day and night will often help with the symptoms. Some babies will, however require medication to lower the production of acid in the stomach, which results in less irritation of the lower oesophagus and less symptoms of discomfort. Other medications which empty the stomach more efficiently may sometimes be required.

The majority of babies with GOR, settle within 3 months of birth. Others can persist until solids are commenced and a more upright posture such as sitting or standing occurs.

If despite treatment with medication, weight loss, recurrent chest infections, anaemia or damage to the oesophagus occur as a result of the refluxing acid, then an operation to stop the reflux will be necessary.

A fundoplication is an operation in which the upper part of the stomach is wrapped around the lower end of the oesophagus and the diaphragm is tightened around the oesophagus. When required, this operation can be performed laparoscopically or open and is very successful.

Hirschsprung's Disease

Hirschsprung's Disease is a condition in which certain components of the nervous system of the bowel are absent. These components are called ganglion. If the ganglion are absent, the affected bowel remains in spasm and is unable to propel the contents of the bowel any further.

Causes

The cause of intussusception is largely unknown, however, there is an hereditary component to it and certain genetic changes have been identified that have been present in some children with Hirschsprung's Disease. There is a similar condition called Chagas Disease, which is secondary to an infection which occurs predominantly in South America, which causes the death of ganglion. There is no evidence that any infection during pregnancy causes Hirschsprung's Disease.

Who gets it?

Hirschsprung's Disease occurs in approximately 1 in every 5,500 babies and affects boys 5 times more often than girls. The disease affects the bowel from the bottom end upwards for varying distances. Most commonly, it affects the lowermost part of the bowel, however, occasionally it can affect the entire large bowel and, rarely, the small bowel also.

What are the signs and symptoms?

Most babies who have Hirschsprung's Disease do not pass meconium on the 1st or 2nd day of life. There may also present within this time signs of a bowel obstruction, including swelling of the abdomen and bile stained vomiting. Sometimes, Hirschsprung's Disease may be present in the older baby or child with infrequent bowel actions since birth. Some of these children may only have their bowels open every 8-10 days.

How is the diagnosis confirmed?

The most important test to confirm the diagnosis is a biopsy of the lowermost part of the bowel. This is called a suction rectal biopsy which is not painful and can be performed by a Paediatric Surgeon with the baby awake. The babies often become distressed, however this is usually due to them being held still in a slightly uncomfortable position. Following the biopsy, there may be a day or two of blood mixed with the bowel actions.

What happens next?

Any baby or child who is thought to have Hirschsprung's Disease is immediately started on antibiotics. Their bowel is cleaned out using enemas and the biopsy is performed when the bowel is clean. Soon after the diagnosis has been confirmed, an operation will be performed to remove the affected part of the bowel and to bring the normal bowel down, near to the anus, in order to allow the baby to have normal spontaneous bowel actions.

What happens if this condition is not treated?

If a baby with Hirschsprung's Disease is not treated, there will be very infrequent bowel actions and there may be complications as a result of a bowel obstruction. There may also be a serious infection of the bowel, which can result in death. Once treated the prognosis is excellent. However, it is important to ensure that bowel actions are kept soft and to remain aware of the possibility of later bowel infection (enterocolitis) that can make the child very unwell. Any child with Hirschsprung's Disease (either before or after the major operation) who is unwell, with a swollen abdomen, with or without bloody diarrhoea will need emergency admission to hospital for intravenous antibiotics and washouts of the bowel.

In those babies in whom initial washouts of the bowel are unsuccessful in clearing out the bowel contents, a temporary colostomy will be required before the major operation can be safely performed at a later date.

Hydrocoele

An hydrocoele is a collection of fluid that surrounds the testicle.

In the majority of cases it is caused by fluid from the abdomen that has become trapped in a space that surrounds the testicle. Occasionally, it may occur after infection or inflammation of the testicle or epididymis and it may occur following a twist of a part of the testicle or epididymis. An hydrocoele may also develop after a trauma to the testicle and very occasionally may occur in the presence of a testicular cancer.

Over 50% of baby boys are born with some degree of hydrocele. It occurs more commonly on the right side. In 10-20% of cases, it occurs on both sides.

It almost exclusively occurs in boys, however, it can occur in girls who have a small out-pouching of the lining of the abdomen.

When does this need referral to a paediatric surgeon?

An hydrocoele usually presents at birth with a soft painless swelling in the scrotum. It does not cause any distress to the babies, however, if they are distressed or crying for other reasons, it may become more obvious.

Any child that has a swelling in the scrotum should be reviewed by a Paediatric Surgeon. The diagnosis of an hydrocoele is made without the use of any tests, however, an ultrasound may occasionally be used to confirm the diagnosis.

When to operate?

In over 90% of boys who are born with an hydrocoele, the hydrocoele will resolve of its own accord within the first 12-18 months of life. If the hydrocoele persists, there may be a small persisting communication with the abdomen, allowing the hydrocoele to fill with the fluid that bathes the guts. If an hydrocele is still present at 18 months of age, it is unlikely that it will then resolve and an operative repair should be recommended. The repair is usually performed before the child starts Nursery School. Even though it is unlikely that the hydrocoele will cause any problems, all little boys prefer to be the same as their friends and do not want to be teased if they have a noticeable swelling in their scrotum.

Following the repair of the hydrocoele, the prognosis is excellent and the chances of recurrence are slight.

Hydrocoele Repair

The operation for repair of hydrocoele is required if an hydrocoele in a baby does not resolve of its own accord. If an hydrocoele has not resolved by 18 months of age, it is highly unlikely that it will continue to do so. The operation may be performed at any age after this.

How is the operation performed?

Under a general anaesthetic, a cut is made in the child's inguinal region of his groin. The Paediatric Surgeon locates the persistent communication between the abdominal cavity and the area around the testicle. This is carefully separated from the vas and the blood vessels that supply the testicle. The communication is then divided and tied flush with the internal lining of the internal abdominal cavity. Any fluid that has remained within the hydrocoele is then drained. Multiple stitches are used, however they are not visible, and dissolve of their own accord over the subsequent 1-2 months. Whilst the child is asleep, the nerves to the area are blocked using a local anaesthetic. The operation takes up to 45 minutes including anaesthetic time, and is a day case procedure.

What happens after the operation?

After the operation, the child should be comfortable and over the subsequent day should only require a few more doses of analgesia by mouth. The child may bath or shower if it is comfortable to do so.

Are there any complications?

The complications following this operation are uncommon and include bleeding or bruising, and infection. The bleeding or bruising usually stops of its own accord and rarely requires any further attention. If infection occurs, it is usually 2-3 days later and may require a course of antibiotics.

Following the operation, recurrence of the hydrocoele is extremely uncommon and occurs in less than 1% of cases. The scar will become barely visible as a fine white line if it is located within a skin crease.

Hypospadias

This is a condition affecting boys where the urinary opening is not at the tip of the penis. Boys with hypospadias cannot pass urine, or ejaculate when older, in a straight line. They have difficulty therefore urinating into a toilet whilst standing, and if the hypospadias is not corrected, their fertility may be compromised. There may also be an abnormal bend, and a deficiency of foreskin on the undersurface of the penis.

Treatment

An operation is necessary to correct hypospadias, and this may be performed at anytime after 6 months of age. Ideally the penis will be normal prior to the boy starting nursery school.

A short stay in hospital is required, and a stent or catheter is usually necessary. The dressing and stent will be removed 5-7 days after the operation, either in the clinic, or back on the ward.

Follow Up

Regular follow up will be arranged over the following 12 months.

Risks Or Complications

After the operation, wound infection which responds to antibiotics, and fistula formation are possible complications. A fistula has occurred if there is leakage of urine from the shaft of the penis rather from just the tip of the penis. A fistula may be repaired successfully, 4-6 months after the initial operation. Other complications include narrowing of the penile urethra/urinary channel.

Inguinal Hernia

An Inguinal Hernia is a lump in the groin, which is caused by a part of the bowel, or other contents of the abdomen, protruding through an opening in the lining of the abdomen, near to the groin.

In children, this opening which occurs normally in the developing foetus, should have closed over before birth. However, in approximately 5% of boys and 1% of girls, it remains open, even after birth.

Inguinal hernias occur more commonly in boys, as the opening is intimately associated with the normal descent of the testicle. It is more common on the right side and in approximately 15% of cases, it will occur on both sides.

An inguinal hernia will usually present during the first year of life, but may present at any stage during childhood. It usually presents as a lump in the groin which comes and goes. If a child becomes distressed for other reasons, the hernia may become more prominent.

What if the Inguinal Hernia is not treated?

In children under the age of 1 year, there is a strong chance that the hernia will become stuck. If this happens, the child will be in pain, and the protruding bowel is at risk of becoming damaged. In boys, there is also a risk of damage to the blood supply of the testicle. Sometimes the hernia may extend all the way down into the scrotum. In girls, the ovary may protrude as part of the hernia and may be wrongly diagnosed as an enlarged lymph gland in the groin. Inguinal hernias may also present with a bowel obstruction, which can be recognised by swelling of the abdomen, bile stained vomiting and the absence of bowel actions.

When to Operate?

Any child under the age of 1 year who has a lump in the groin should be reviewed urgently by a Paediatric Surgeon. As the risk of hernias becoming stuck and causing problems is less after 1 year of age, the situation is less urgent but nevertheless, the child should be reviewed by a Paediatric Surgeon.

When is an operation necessary?

Inguinal hernias do not go away of their own accord and they will require an operation to repair them. Children under the age of 1 year require an operation as soon as possible but in children over 1 year of age the urgency for operation is of course less. Occasionally, if the Paediatric Surgeon is unable to reduce the hernia back into the abdomen when the child is initially seen, an emergency operation may be required.

What are the results following operation?

Once the hernia has been repaired, there is less than 1% chance of the hernia recurring. If there has been no damage to the bowel, or the blood supply to either the testicle or ovary, the prognosis is excellent.

Inguinal Hernia Repair

As the name suggests, this is an operation that is performed in children to correct an inguinal hernia. In any child that has an inguinal hernia, an operation is necessary as inguinal hernias do not disappear of their own accord. In children under the age of 1 year the possibility of complications occurring as a result of inguinal hernia is high, and because of this, the operation should be performed within a few weeks after the diagnosis has been made.

How is it performed?

Under a general anaesthetic, a cut is made in the inguinal region of the groin. The pouch or 'sac' through which the hernia has protruded, is carefully separated from the adjacent vas deferens and blood vessels supplying the testicle, in boys. Once the sac is completely separate, it is divided and tied off flush with the inside of the abdominal cavity. During the operation, the nerves to the area of the cut are anaesthetised using local anaesthetic. Multiple stitches are used, however, they are not visible at the end of the operation and dissolve of their own accord over the subsequent 1-2 months. The operation takes up to 45 minutes, including anaesthetic time, and the child is sent home once he or she has recovered from the anaesthetic usually after 2-3 hours.

What happens after the operation?

After the operation, the child is usually comfortable and may only need 1-2 doses of painkillers, by mouth, over the next 24 hours. There is no need to avoid bathing quickly or showering when the child is comfortable. The most common complications of the operation are bruising and infection. The bleeding or bruising usually stops of its own accord but may sometimes require a little pressure on the area. If infection occurs, it usually happens 2-3 days later and may require antibiotics, either from the Paediatric Surgeon or the General Practitioner.

What are the dangers of inguinal hernias?

In those babies who have had an inguinal hernia that has become stuck, there is a higher risk of damage to the bowel that is stuck in the hernia. Damage to the blood supply of the testicle may also have occurred. Unfortunately, some of these babies have already suffered resultant damage to their testicle by the time they come to an operation. The testicle that has been affected in these babies will either decrease in size or, if the damage has been more severe, will wither away to almost nothing.

What are the results following an operation?

The operation for inguinal hernia repair in children is extremely successful and the chance of recurrence is less than 1%. The scar will become barely visible if it is located in line with a skin crease.

Intussusception

Intussusception is a condition in which a part of the bowel telescopes into the next part of the bowel further on. It usually occurs at the junction of the small bowel with the large bowel at an area called the ileocaecal valve.

Who gets it?

In the majority of cases, the cause of intussusception is never found. It is probably due to patches in the lining of the bowel which become large, in response to infection. In about 10-15% of cases, intussusception is caused by a polyp, a Meckel's diverticulum, a cyst in the wall of the bowel, or a small cancer.

Intussusception occurs in about 1 in 350 young children. It usually occurs between 4 and 10 months of age, but may occur at any age. If intussusception occurs in babies younger than 1 month of age, or children that are older than 3 years of age, there is an increased chance that it is caused by a cyst, a polyp, a Meckel's diverticulum or a cancer.

What are the symptoms?

The symptoms of intussusception often occur after 2-3 days of an associated illness with a temperature. The baby will develop spasms of pain in the abdomen and will draw up its legs in response to this. The child will become pale, will stop feeding properly and may even vomit once or twice in the early stages. As time goes by, the child may develop signs of a bowel obstruction with swelling of the abdomen, bile stained vomiting and a reduction in the number of normal bowel actions. At some stage the child may also pass a bowel action which is thick with mucous and blood. In over a third of cases, the Paediatric Surgeon will be able to feel a sausage shaped lump in the right side of the abdomen.

When to Refer?

Any child who is suspected of having an intussusception should be reviewed urgently by a Paediatric Surgeon. Investigations include, an ultrasound of the abdomen and sometimes a contrast enema.

Management

The child may need to be resuscitated with intravenous fluids and will be given medications to relieve the pain. In the majority of cases, the intussusception can be pushed back into place by performing an enema, in which air is pumped into the bowel from the bottom end. If the bowel does not pop back into place with the assistance of air pressure, the child will need an operation. In some cases when the intussusception has been present for some days, a portion of the bowel may need to be removed if it has become too badly damaged to survive.

Once the intussusception has been reduced, the prognosis is excellent. In those children whose intussusceptions were reduced using air pressure, the chance of intussusception occurring again is about 10%. In those children who have an operation, the chance of recurrence is about 2%. It is certainly

preferable though to avoid an operation if possible.

What would happen if this condition was not treated?

If an intussusception is left too long without being treated, the child may become desperately unwell. The bowel may burst, causing peritonitis and septicaemia and sometimes death may ensue.

Orchidopexy

Orchidopexy is an operation in which the Paediatric Surgeon moves an undescended testicle down into the base of the scrotum. An orchidopexy is indicated in those boys whose testicle has not fully descended into the scrotum by the age of 1 year of life.

Why does the operation need to be performed?

Orchidopexy is performed to maximise fertility, to minimise the chance of trauma or torsion (twist), to ensure cosmetic symmetry in the scrotum and to make it easier for the boy, when he is older, to check himself thoroughly for cancers of the testicle.

How is the operation performed?

Orchidopexy is performed as a day case procedure. Under a full general anaesthetic, a cut is made in the inguinal region of the groin as well as on the base of the scrotum. The Paediatric Surgeon identifies where the testicle is located and carefully mobilises it to a sufficient length to enable its placement within the scrotum. At the same time, the sac of a potential hernia which is present in up to 90% of cases, is also tied off and removed. Once fully mobilised, the testicle is passed down into the scrotum and placed in a pouch just below the skin. The stitches on the scrotum may be visible after the operation, however, they will dissolve of their own accord within 2-3 weeks. The stitches in the groin are under the skin and should not be visible. They also dissolve of their own accord but after 1-2 months. Whilst the child is asleep, the nerves to the scrotum and groin are anaesthetised with local anaesthetic. The operation takes approximately one hour.

What happens after the operation?

After the operation, the child is usually comfortable for 6-8 hours, after which time he may require regular pain relieving medication by mouth for 3-4 days. The child may shower or have a quick bath whenever he feels comfortable to do so. In most cases, the boys who undergo an orchidopexy have a week off school, but there is no necessary restriction to their activities.

What are the possible problems after the operation?

The two most common complications are bleeding/bruising and infection. Both the groin area and the scrotum may become significantly swollen and bruised following the operation, however, it is unusual that any further operations are required and this usually resolves of its own accord after 1-2 weeks. If either of the wounds become more red, more swollen and more sore rather than less so 2-3 days following the operation, then infection is almost certainly present. If infection occurs, it usually responds to a course of antibiotics. In some boys who have a particularly high testicle, the blood supply to the testicle may be damaged as a result of the operation. Parents are usually warned of this possibility before the operation. If this complication occurs, the testicle will become smaller, and may wither away to almost nothing over the subsequent weeks.

Will the operation be successful?

The results of the operation are usually excellent, however, in approximately 5% of cases a further operation may be necessary to bring the testicle down into the scrotum again as it may tend to drift higher as the boy becomes taller. Because of this possibility occurring, the Paediatric Surgeon will need to review the boy on a regular basis for some years after the operation.

Painful Scrotum

The appearance of a red, swollen, painful scrotum should always be treated as an emergency situation. This collection of signs and symptoms is known as an "acute scrotum".

What are the causes?

The causes of an "acute scrotum" include trauma, twist of the testicle (torsion), twist of a part of the testicle, infection of the testicle and/or epididymis and swelling of the scrotum for no known cause.

Infection in the testicle or epididymis and 'idiopathic scrotal oedema' (no known cause of swelling) are not common in children and are diagnoses that should only be made by a Paediatric Surgeon.

A twist of the testicle or in other words a testicular torsion, occurs either in newborn babies, or boys who are approaching puberty. The cause of the torsion, in these two age groups, is due to an increase in the mobility of the testicle within different tissue layers surrounding the testicle in the two different age groups.

Unfortunately, in the babies who have a testicular torsion, by the time the diagnosis has been made, it is usually too late to save the testicle.

In older boys with a testicular torsion, they will present with a swollen testicle and associated pain in the scrotum that may extend to the loins. There is usually associated nausea and sometimes vomiting. The scrotum on the affected side will be red and swollen, and the testicle may be sitting higher and more horizontal than the normal testicle on the other side.

When to operate

The diagnosis is usually confirmed by a Paediatric Surgeon, and the operation to fix the testicle should not be delayed by any further investigations. If the testicular torsion is fixed within 6 hours of the twist occurring, there is an excellent chance that the testicle will survive. At the same operation the other testicle is also fixed in place in order to prevent a twist occurring in that testicle.

If the affected testicle is already dead, it will need to be removed.

A twist of a part of the testicle, known as torsion of the testicular appendage, is the most common cause of "acute scrotum" in children. It occurs when a small piece of tissue, situated on the upper part of the testicle, twists on itself. Often this twisted portion appears as a tender black spot, seen through the skin of the scrotum at the upper part of the testicle. If carefully examined, the rest of the testicle is not tender.

Torsion of the appendage, once diagnosed by a Paediatric Surgeon, can be managed with pain relieving medication and usually the pain resolves within 2-3 days. If the pain persists or recurs or if there is any doubt about the diagnosis, a Paediatric Surgeon will need to operate to correct the problem or to resolve the dilemma about the diagnosis.

When is an operation not necessary?

Infection of the testicle or epididymis should resolve with antibiotics that need to be given for 2 weeks. Again, if there is any doubt about the diagnosis, and torsion of the testicle is a possibility, then an operation will be recommended.

In idiopathic scrotal oedema, usually both sides of the scrotum and often the skin above and below the scrotum is thickened and red. The cause of idiopathic scrotal oedema, as mentioned earlier, is unknown, however, it may represent an allergic or immunological reaction.

Once this condition has been diagnosed by a Paediatric Surgeon, antihistamines or antibiotics may be prescribed. However, there is no evidence to suggest that they have a significant effect. In the majority of cases, idiopathic scrotal oedema disappears after 3-4 days.

Phimosis

Phimosis is a condition in which the foreskin is too tight to pull all the way back.

Phimosis is normal in all baby boys and may be present for some years, until the foreskin has become supple enough and stretched enough to be pulled back, so that the head of the penis may be seen completely.

When is phimosis a concern?

In some cases, there may be scarring of the foreskin which may result in a permanent phimosis. The scarring may be caused by infection or inflammation of the foreskin, or forced stretching of the foreskin causing splitting, before it is ready to be stretched. Approximately 10% of boys develop scarring with phimosis.

When should the foreskin be able to retract?

Most boys are able to fully retract their own foreskins by 5 years of age. Some boys take longer than 5 years but if there is no evidence of significant scarring, then there should be no harm in waiting a few more years before becoming concerned.

Who needs a circumcision?

Boys who have either tight, normal phimosis or scarring with phimosis are unable to pull their foreskins back completely, and as a result of this there may be ballooning of the foreskin when it fills with urine. Those boys who have particularly tight foreskins, may experience pain when they have erections.

If there is a possibility of scarring causing the phimosis, the boy needs to be seen by a Paediatric Surgeon. If the Paediatric Surgeon believes that the phimosis will not resolve of its own accord, then circumcision will be recommended.

Are there any dangers?

Phimosis with scarring if left untreated, can result in further infections of the foreskin and even urinary infections. Once circumcision has been performed, there are not usually any ongoing problems.

Pyloric Stenosis

Hypertrophic Pyloric Stenosis or HPS, is a condition in which there is a thickening of the muscle in the wall of the intestine, just beyond the stomach.

What causes this condition?

The cause of HPS is essentially unknown, however, there are a number of theories that have been suggested. Many of these theories suggest an absence, or a deficiency of particular proteins or chemical message receptors in the muscle of the gut which is affected. The part of the gut that is affected is approximately 2 cm long and is called the pylorus.

Who Develops HPS?

HPS occurs in approximately 1 in every 350 babies and occurs most commonly between the ages of 2 and 10 weeks. It occurs more commonly in boys than girls, and in children of parents who had HPS when they were babies. First born boys, are more likely than others to develop HPS. This suggests an hereditary or genetic susceptibility, which is in fact greater if the mother had HPS rather than the father.

How do children with pyloric stenosis present?

The child with HPS will present with increasing numbers of large milky vomits, and will vomit within half an hour of every single feed. Immediately after vomiting, the baby will be hungry again.

HPS is not a painful condition, however, it is potentially a life threatening one, as the babies can become dehydrated very quickly.

A baby that is developing HPS may not thrive and may in fact lose weight. A baby who is becoming dehydrated will have fewer and fewer wet nappies and as no food/milk is going through the gut, the baby will have less and less soiling of its nappies.

With increasing dehydration, the baby will become irritable and then will eventually become quiet and listless, with sunken fontanelles, dry mouth and lips and reduced elasticity of the skin.

How is the diagnosis made?

When a Paediatric Surgeon examines a baby with HPS, he may see waves of stomach contractions.

When he feels the abdomen after the baby is given a feed, he should be able to feel the thickened muscle in the upper part of the abdomen.

An ultrasound of the pylorus is the most accurate and safest test that can be performed to confirm the diagnosis.

How is this condition managed?

Having made the diagnosis, it is important that the Paediatric Surgeon

resuscitate the baby before an operation is performed. The babies with HPS usually require an intravenous drip to give them fluids in order to reverse their dehydration. They are also given sugar in the drip to provide energy for the brain as well as salts to prevent changes in the rhythm of the heart.

This intravenous resuscitation may take up to 3 days before the baby is stable enough for an operation. During this time, a drainage tube is left in the stomach via the nose to prevent a build up of saliva and secretions within the stomach.

What operation is performed?

The standard operation for HPS is called a Pyloromyotomy, which is performed via a small cut in the abdomen usually at the level of the belly button.

The aim of the operation is to cut the muscle of the pylorus and to stretch it far enough apart, so that it no longer causes an obstruction to the drainage of milk from the stomach.

A pyloromyotomy can be performed laparoscopically with or without a balloon placed on the inside of the gut to stretch open the pylorus from within. There has been no significant advantage demonstrated performing this operation laparoscopically with or without the use of a balloon within the bowel.

If the diagnosis of HPS is delayed, the baby will become increasingly sick and may die from the complications of dehydration.

What is the prognosis?

The prognosis following the operation for HPS is excellent and the baby is usually feeding normally within two days.

Sometimes, after the operation the baby will continue to vomit intermittently. This is usually due to reflux of milk, or in other words gastro-oesophageal reflux, which will have been present even before the pyloric stenosis developed.

There is less than 1% chance of the baby requiring a further operation for the same condition.

The best investigation if necessary to demonstrate that the operation has been successful, is an x-ray in which the baby swallows fluid mixed with contrast material, which should show normal emptying from the stomach into the rest of the bowel.

Tongue-Tie

Tongue-tie is a common condition in which the tissues or membranes on the under surface of the tongue are too tight to allow the tongue to be fully extended. It is a problem which occurs as the tongue develops in the first 3 months of the unborn baby's life.

The cause of tongue-tie cause is unknown, however it often runs in families. It is usually noticed within the first year of life. Unless severe, it does not interfere with feeding.

Many tongue-ties loosen up significantly after 1 year of life, when the baby starts to say a few words and when the lower front teeth start to develop.

Why operate, and when?

If after 1 year of life the baby is unable to protrude its tongue beyond its front teeth, it will probably interfere with the development of normal speech. Under these circumstances, the Paediatric Surgeon will recommend an operation to release the tongue.

There are varying degrees of tongue-tie. As the vast majority are not severe, most do not require an operation. In some cases the parents, or the child, may request the operation to allow the child to fully poke out its tongue for social reasons!

Apart from feeding difficulties, speech problems, tooth decay or difficulty in licking ice creams, in those children who have a severe tongue-tie, there are no associated complications and the prognosis following the release of tongue-tie is excellent.

Umbilical Hernia

An umbilical hernia is a protrusion of abdominal contents at the umbilicus, or belly button.

It is caused by a failure of the umbilical ring to completely close over once the umbilical cord has withered away and fallen off.

Umbilical hernias occur in up to 30% of babies and young children. It affects boys and girls equally.

Once the belly button has healed, approximately 1-2 weeks after birth, an umbilical hernia is easily recognised as a lump that comes and goes at the site of the belly button. When the child is distressed for other reasons, the umbilical hernia will usually become more noticeable.

In the vast majority of children with umbilical hernias, it is easy to push the hernia back into place. They are not usually tender and do not usually cause pain or discomfort.

When does this need referral to a paediatric surgeon?

In over 90% of babies who have an umbilical hernia, the hernia will disappear within the first 12-18 months of life as the umbilical ring continues to close. If the umbilical hernia is still present at 18 months of age, it is unlikely that it will disappear of its own accord. In children who have a persistent umbilical hernia, they should be reviewed by a Paediatric Surgeon, and the treatment of choice is an operative repair of the hernia.

Does this need an operation?

Although cosmetically undesirable, it is unusual for there to be any complications. Unlike inguinal hernias, it is rare for umbilical hernias to become stuck.

Once the umbilical hernia has been repaired, it is highly unlikely that it will recur. The resulting scar will be barely visible.

Undescended Testicle

An undescended testicle is a testicle which has not descended fully into the base of the scrotum by the time a baby boy is born.

Why does this condition occur?

The reason why a testicle may not fully descend is uncertain, however it may be due to a failure of chemical messages getting through to the testicle and associated structures at a critical time in the unborn baby's development. Another possibility is that the testicle itself has developed abnormally, and even though the chemical messages may be appropriate, the testicle and its associated structures are unable to respond appropriately to achieve complete descent.

How common is this condition?

Approximately 3% of baby boys are born with an undescended testicle. It is more common on the right side and may sometimes occur on both sides.

When can this be diagnosed?

At birth, or shortly after birth, the parents, doctors, or nurses will usually notice that either one or both testicles are not present in the scrotum. As the testicle originally develops at the level of the kidneys, it may be located anywhere between the kidneys and the top of the scrotum.

In the majority of cases, the undescended testicle is located in the inguinal region of the groin and is easily felt by a Paediatric Surgeon. Occasionally, the testicle may be found in the thigh adjacent to the scrotum, or even on the other side of the scrotum.

When a Paediatric Surgeon is unable to feel an undescended testicle, it is likely to be either located within the abdomen or to be completely absent. In this circumstance the testicle is called an 'impalpable testicle'. An ultrasound may sometimes be employed to locate the testicle, however, if the testicle is within the abdomen, an ultrasound is not particularly reliable.

If the testicle has undergone torsion (twist) either before birth or shortly after birth and has withered away to a small nubbin of tissue, it may also be 'impalpable'.

When To Operate?

As a large number of undescended testicles continue to descend until the age of 1 year, the Paediatric Surgeon will not suggest an operation prior to this time unless complications occur.

Approximately two thirds of undescended testicles first noticed at birth will descend into the base of the scrotum by 1 year of life. If the testicle remains undescended at 1 year, an orchidopexy will be recommended.

An orchidopexy is best performed by a Paediatric Surgeon and is an operation in which the undescended testicle is brought down to the base of the scrotum. For the health of the testicle, the operation should ideally be

performed as soon after the first birthday as possible.

Why operate?

The undescended testicle is brought down into the scrotum to maximise fertility, to avoid the risk of trauma, or torsion (twist) and to achieve relative symmetry in the appearance of the scrotum.

Undescended testicles are at an increased risk of developing cancer. This risk is approximately 1 in 40,000, and if it occurs it usually occurs between the ages of 12 and 35 years. It is of course more easily and earlier detected if the testicle is located in its normal position within the scrotum.

As most undescended testicles have the potential to also develop an inguinal hernia, parents should be made aware of this possibility. If an inguinal hernia was to develop in the first year of life, it would need to be repaired urgently, and the undescended testicle may in some circumstances be brought down into the scrotum at the same time.

When is a two stage operation appropriate?

In particularly high undescended testicles, or in the testicles that are located within the abdomen, the operation to bring the testicle down to the scrotum may need to be done in two stages.

What are the long term results?

After the testicle has been brought down in to the scrotum, the prognosis is excellent in the majority of cases.

Fertility in these boys is no different from that of the general male population, however, if there has been undescended testicles on both sides, fertility is reduced by about 30%.

Fertility in both single and double undescended testicles may also be further reduced if the operation is delayed beyond 2 years of life.

About Eric A. Nicholls...

Seeing and diagnosing children each day, I understand the importance of communicating effectively with my young patients and their families - as I don't have one patient but most often three: child, mum and dad.

The purpose of this booklet and my website at ***www.childrensurgery.co.uk*** is to provide information about a number of medical issues that can occur in childhood which are typically resolved through surgery and to outline treatment options and what can be expected both by the child and by the family as a whole.

I am a father of 4 and a Consultant Paediatric Surgeon, and Head of Department at St George's Hospital, London. I am also an Honorary Senior Lecturer with The St George's Hospital Medical School, University of London, and a Senior Journal Article Reviewer with the Journal of Paediatric Surgery.

I am a general paediatric surgeon with a special interest in neonatal, and gastro-intestinal surgery. I provide vascular access for long term parenteral nutrition, or chemotherapy for children at the Royal Marsden Hospital.

I perform appendicectomies, cholecystectomies, splenectomies, and fundoplications laparoscopically when appropriate, and I perform many Percutaneous Endoscopic Gastrostomies for assisted nutrition. The most frequent operations that I perform are for inguinal hernias, hydrocoeles, undescended testicles, and belly button (umbilical) hernias, as well as circumcisions, and release of tongue ties.

The more common neonatal conditions I manage include Hirschsprung's disease, malrotation, atresias of the oesophagus, and bowel.

My common consultations are for hernias, testicular swellings, undescended testicles, abdominal pain, bowel problems, gastro-oesophageal reflux, tongue tie, problems with foreskins such as phimosis and subcutaneous swellings including neck lumps.

Contacts...

This booklet and its accompanying website at ***www.childrensurgery.co.uk*** are informational resources created by Eric A. Nicholls, Consultant Paediatric Surgeon.

Mr Nicholls has private clinics in and around London and in Guildford at the hospitals listed below. His Practice Manager can be contacted at the Nuffield Health Hospital's address and telephone number.

Nuffield Heath Hospital

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GU2 7RF

Telephone (Mr Nicholls' Practice Manager): 01483 207 252

Harley Street Paediatrics

78 Harley Street
London
W1G 74J

To book a consultation, please telephone Mr Nicholls' Practice Manager. Her telephone number is 01483 207252

Parkside Hospital

53 Parkside
Wimbledon SW19 5NX

To book a consultation at Parkside Hospital you will need to phone the Outpatient Bookings Clerk. Please note that this number does not connect you to a secretary. Outpatients Telephone: 0208 971 8026

St George's Hospital

Blackshaw Road
London SW17 0QT

The Lister Hospital

Chelsea Bridge Road
Chelsea SW1W 8RH

To book a consultation at The Lister Hospital you will need to phone the Outpatient Bookings Clerk. Please note that this number does not connect you to a secretary. Outpatients Telephone: 0207 730 8298

The Portland Hospital

205-209 Great Portland Street
London
W1W 5AH

Telephone: 020 7580 4400

The Princess Margaret Hospital

Osborne Road
Windsor
Berkshire
SL4 3SJ

To book a consultation at The Princess Margaret Hospital, please telephone Mr Nicholls' Practice Manager. Her telephone number is 01483 207252