

# Inguinal hernias and hydroceles in infancy and childhood: A consensus statement of the Canadian Association of Paediatric Surgeons

**A** paediatric inguinal hernia is usually a protrusion of intra-abdominal contents through a patent processus vaginalis. The processus vaginalis is an outpouching of the peritoneum through the internal inguinal ring, which normally closes spontaneously following testicular descent. Incomplete obliteration of the processus vaginalis may result in an abnormal communication between the abdominal cavity and the inguinal region. The congenital hernia of infancy and childhood is not a 'rupture' or a muscle weakness, and it should not be referred to as such.

Hernias occur in 1% to 4% of all infants; the incidence may reach 30% in premature infants (depending on the child's gestational age at birth). One third of all children with hernias present before six months of age (1,2).

Most hernias occur in males, with a male to female ratio of 6:1. Correct recognition and initiation of the proper therapeutic route are essential for an excellent outcome, which should approach 100% success.

## UNCOMPLICATED INGUINAL HERNIAS

Most children present with a history of intermittent swelling in the inguinal region, which in males, may extend to the scrotum. The presence of a mass or thickening in the inguinal canal, or at the level of the internal inguinal ring is diagnostic. The swelling is usually nontender and readily reducible with gentle pressure.

Most inguinal hernias are diagnosed by either a parent who notices a bulge when a child is straining or crying, or

by a physician during a routine physical examination. Some discomfort may be present because many infants with hernias are 'fussy'; the discomfort resolves after repair. In males, it is important to verify that the testicle is in the scrotum; the bulge of an undescended or retractile testicle may mimic an inguinal hernia.

The differential diagnosis for uncomplicated inguinal hernias includes hydrocele and lymphadenopathy. In these cases, however, the inguinal canal will feel entirely normal (1,2).

## Treatment

A paediatric inguinal hernia will not close spontaneously, and it must be repaired. While repair is not a surgical emergency, prompt referral to a paediatric surgeon is recommended.

Most inguinal hernia repairs in full term, healthy infants and older children may be performed electively in an outpatient setting soon after the diagnosis is made. Infants younger than one year of age, particularly former preterm infants, are at greater risk for an incarcerated hernia. Repairs in preterm infants should be carried out as soon as it is convenient, preferably within one week of diagnosis. After surgery, overnight hospitalization may be necessary to monitor postoperative apnea in preterm infants and children with special needs (eg, with a ventriculoperitoneal shunt, cardiopulmonary disease) (3).

There is significant controversy concerning contralat-

eral inguinal exploration. While a contralateral patent process is found in about 40% of children, the actual risk of a metachronous hernia is estimated to be 10% to 15%, with reports ranging from 1% to 34% (1,2). Consequently, opinions vary widely between performing contralateral exploration in all females and young males or only in cases when a contralateral hernia is clinically suspected.

Few complications should occur following elective hernia repairs. In addition to the usual wound infections and bleeding problems, specific complications may include hernia recurrence, testicular atrophy and injury to the vas deferens (all of the above occur in less than 1% of children). Scrotal swelling is frequent in small infants, with resolution occurring by six months after surgery.

### INCARCERATED AND STRANGULATED HERNIAS

Incarceration of an inguinal hernia is most common in the first year of a child's life. The incidence of incarceration decreases with age, but it never disappears entirely, and incarceration must be considered in children with hernias at any age.

An incarcerated hernia usually presents as firm swelling in the inguinal region (possibly extending to the scrotum), which is tender to palpation and does not reduce readily with pressure. The child may be extremely irritable and unwilling to eat. Intestinal obstruction, with abdominal distension and vomiting, may be present.

The differential diagnosis of an incarcerated hernia includes inguinal lymphadenitis, torsion of the testicle and acute hydrocele. The bowel, ovaries or fallopian tubes are the organs that are most commonly incarcerated. An incarcerated hernia may progress rapidly to strangulation, a situation where vascular compromise and, possibly, infarction of the incarcerated contents have occurred. Fortunately, this occurrence is quite rare.

While the strangulation of incarcerated bowel is almost inevitable if it is neglected, the strangulation and necrosis of an ovary or fallopian tube is less common. The diagnosis of a strangulated hernia can be made by palpating a firm, oval mass in the inguinal canal.

### Treatment

Reduction of an incarcerated hernia should be attempted, and it can be achieved in the majority of cases. Sedation (with an opiate or short acting benzodiazepine) and firm, steady pressure over the hernia for up to half an

hour may be necessary. If the reduction is successful, the child should be admitted to hospital (because of the high risk of recurrence), and surgical correction undertaken one to two days later (to allow edema to resolve) (4).

If an experienced surgeon cannot reduce the hernia or if the signs of strangulation are present, emergency surgical intervention is mandatory. Under these circumstances, resection of a segment of ischemic bowel may be necessary. The patient should be referred immediately to a paediatric surgeon.

The risks of a recurrent hernia, wound infection, scrotal swelling and injury to the vas deferens are higher for emergency surgical intervention than for elective hernia repair. In addition, the risk of testicular injury is significant in strangulated hernias.

### HYDROCELE

A hydrocele is a collection of fluid in the scrotum without an obvious inguinal hernia. The typical hydrocele is observed at or shortly after birth as a unilateral or bilateral swelling in the scrotum, which may fluctuate in size (5).

The scrotum appears enlarged with fluid; it may be very tense, is usually nontender and is, often, bluish in colour. The inguinal canal is normal. Although most hydroceles will transilluminate, a fluid- or gas-filled bowel may transilluminate as well, especially in infants. Elective referral to a paediatric surgeon is advised.

The recommended management of a hydrocele is observation during the first one to two years of a child's life, unless the diagnosis of a hernia cannot be excluded. Hydroceles that persist or appear beyond that age are unlikely to resolve spontaneously and should, therefore, undergo elective surgical repair.

### REFERENCES

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