Chapter 14
Orchidopexy and Orchidectomy

Kim A.R. Hutton

Orchidopexy

Name of Procedure

Open orchidopexy.

Lay Description

An open operation that relocates a testis, that is sited in an abnormal position, into the scrotum. Usually the undescended testis is positioned in the groin or occasionally within the tummy.

Intended Benefit

To provide improved cosmesis so the patient has two normal appearing testes within the base of the scrotum, to maximize future fertility, to allow self-examination in adult life which is important because of a small increased risk of malignancy in undescended testes, and to reduce the risk of torsion or trauma which is increased in testes not within the scrotum. The undescended testis may be associated with an inguinal hernia sac and this can be transfixed and divided at the same time as the orchidopexy.

K.A.R. Hutton
Department of Paediatric Surgery, University Hospital of Wales, Cardiff, UK
e-mail: kim.hutton@wales.nhs.uk

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What Happens Before the Operation?

All patients are managed as a day-case. No preoperative blood tests are required. Patients with a palpable testis are operated with open orchidopexy and where the testis is impalpable the child is scheduled for an examination under anesthesia, open orchidopexy if the testis can be felt, and laparoscopy if still impalpable. Preoperative ultrasound or magnetic resonance imaging is not routinely required. Starvation requirements for general anesthesia are 4 h for breast milk and 6 h for formula milk and solids. Clear fluids are allowed until 2 h before the procedure.

Technique

An open orchidopexy is performed under general anesthesia within an operating room environment under usual strict aseptic conditions. The procedure takes 30–75 min depending on complexity. According to surgeon preference and the position of the testis there may be two incisions – one in a horizontal skin crease in the groin around 2–3 cm in length and another in the scrotum about 1–1.5 cm long, or just one 1.5–2 cm incision sited at the junction of the scrotal and groin skin – a scrotal orchidopexy.

For an intraabdominal testis an open procedure may be performed with or without division of the testicular vessels (a Fowler-Stephens procedure) in one or two stages (operations 6 months apart) or a microvascular transfer, although contemporary management of these high testes is usually via keyhole surgery (laparoscopic orchidopexy).

How Is an Orchidopexy Performed?

The surgeon deepens the incision, locates the testis and starts to mobilize it. All tethering tissues are carefully separated from the testis whilst preserving the important structures going to and coming from the organ – the blood supply including an artery and several veins and the sperm tube (doctors call this the vas deferens). Once enough length has been obtained, so the testis can sit in the scrotum without tension, it is routed into its new position and placed in a small pocket the surgeon creates just underneath the scrotal skin. The wound is closed with buried dissolvable sutures and some surgeons prefer tissue glue to close the skin. A wound dressing is optional depending on surgeon preference.

Postoperative Expected Course

The child can eat and drink as soon as recovered from the anesthetic. The anesthetist will often have performed a caudal nerve block in theatre to provide early postoperative pain relief. Otherwise the surgeon as an alternative performs an

intraoperative nerve block and tissue infiltration with local anesthetic. Oral analgesics are prescribed, usually Paracetamol and Ibuprofen, and these are advised regularly in the first 48–72 h. No antibiotics are required before, during or after the procedure and as soon as the boy is mobile, pain-free, and has passed urine he is allowed home. Discharge is usual within 2–4 h of the procedure.

Follow Up

In infants there are no specific precautions apart from a need to keep the wound/dressing area clean and dry. Any wound dressing can be removed after 5–7 days and if Steristrips have been used these can be allowed to fall off on their own. Older patients are advised to refrain from sporting activities, swimming, riding a bike etc. for up to 6 weeks post procedure. A follow up clinic visit is normally arranged at 6–8 weeks post surgery to assess testis position and size.

Risks of Procedure

The success rates for open orchidopexy depend on the initial position of the undescended testis, with testes within the abdomen having higher complication rates of loss of the testis (atrophy), the testis remaining in an unsatisfactory position, or re-ascending into an abnormal location.

General

These are the risks of any anesthetic and of any operation including cardiorespiratory problems, anaphylaxis, pain, bleeding, hematoma, swelling of the scrotal area, wound separation and wound infection. Wound related complications occur in 2.5 % of patients – 2 % related to infection and 0.5 % dehiscence and bleeding [1].

Specific

These are the risks related to orchidopexy itself and the majority fall into two groups:

1. Intraoperative: Failure to achieve enough length on the cord structures to position the testis comfortable within the scrotum, difficulty with securing closure of a flimsy hernia sac, inadvertent damage to the vas deferens or testicular vessels (very rarely the blood vessels to the testis can snap during traction on the cord and dissection), unrecognized torsion of the testis pedicle during routing to the scro-

tum which may affect testis blood supply, and damage to one of the nerves in the groin during dissection that can leave an area of long term numbness in the upper inner thigh (the nerve is called the ilio-inguinal nerve). Intraoperative complications and problems are reported in 1.5 % of orchidopexy operations. Most are related to the vas deferens (1.14 % of cases) with a finding of no vas, the vas not connected to the testis, or the vas inadvertently cut (0.07 %). The need for orchidectomy is 0.36 % [1].

2. Long term: These are related to persistent testis malposition or re-ascent, a smaller than normal testis or a testis that shrinks completely (atrophy) where the blood supply has been severely compromised, possible reduced fertility and a small increased risk of testicular cancer. If the testis re-ascends and is still of adequate size a re-operation is appropriate. A small testis may require excision depending on its location. A testicular prosthesis can be inserted later in childhood if a testis is lost due to atrophy or excision. Success for single stage orchidopexy can be as high as 99 % [2], although reported atrophy rates of 5 % in straightforward orchidopexy and 9 % for high testes highlights the difficulties with some of these surgeries [1]. Although semen parameters may be abnormal in men with unilateral undescended testis corrected in childhood, paternity is close to normal at 90 %, compared to men without a history of undescended testis (94 %). In men with previous bilateral undescended testis paternity rates are reduced to 35–53 % [3]. Boys with isolated undescended testis are three times more likely to develop testicular cancer later in life than those without testis maldescent [4].

Orchidectomy

Name of procedure

Open orchidectomy.

Lay Description

An open operation performed to remove a testis.

Intended Benefit

Removing a small testicular remnant found during surgery for an impalpable undescended testis or at redo orchidopexy is performed because of a small increased risk of testis cancer. Removing a non-viable testis at exploration for acute torsion prevents complications of retained necrotic tissue – pain, wound discharge and breakdown.

What Happens Before the Operation?

Surgery for dysplastic/atrophic testes is carried out as a day-case. No preoperative labs are required, standard starvation guidelines are followed and no antibiotics prophylaxis is necessary. In cases of testis torsion emergency surgery is performed without delay. In all cases the surgeon marks the side preoperatively. In patients with acute torsion the surgeon obtains consent for contralateral testis fixation. In other pathologies the need to fix a solitary testis is unclear and a discussion between the parents, patient and surgeon, with the formulation of a definite management plan is advised [5].

Technique

An open orchidectomy is performed under general anesthesia. In cases where laparoscopy has been performed for impalpable testis and a small dysplastic gonad is found intraabdominally, the orchidectomy is completed laparoscopically. When the hypoplastic testis or nubbin is beyond the deep inguinal ring an inguinal skin crease or scrotal incision is used for excision [6]. Exploration for torsion is through a midline raphe or transverse scrotal incision. The vessels to the testis are ligated and divided separate to the sperm tube and the testis removed. The wound is closed in layers using absorbable sutures, with buried (subcuticular) skin sutures providing optimal cosmesis. No wound drains are required.

Postoperative Expected Course

The child may resume oral intake once recovered from anesthesia. A caudal nerve block performed in theatre prior to surgical incision is often used to provide pain relief in the first several hours postoperatively. Otherwise the surgeon as an alternative performs local tissue infiltration with Bupivacaine. Oral analgesics are prescribed, usually Paracetamol and Ibuprofen, and these are advised regularly in the first 48–72 h. As soon as the child is mobile, pain-free, and has passed urine he is allowed home. Discharge is usual within 2–4 h of the procedure, although cases requiring emergency surgery may stay a little longer.

Follow Up

Most children are back to normal within a couple of days and if of school age can return within a week. Wound dressings if used can be removed after 7 days. Avoidance of sporting activities and riding a bike is recommended for 6 weeks.

Outpatient review is performed 6–8 weeks post surgery to assess the results, discuss pathology reports and answer any ongoing concerns the family may have.

Risks of Procedure

General

There are risks related to the general anesthetic, which are increased in patients with preexisting cardiorespiratory disease. However, modern day anesthesia is extremely safe. Surgical risks include bleeding, infection and wound dehiscence. Wound related complications occur in 1.9 % of patients [7].

Specific

These risks fall into three groups:

1. Risk of torsion in remaining solitary testis: There is limited scientific evidence to guide the need for contralateral testis fixation in cases undergoing orchidectomy, except in patients with testis torsion [5]. When performed in non-torsion cases a sutureless dartos pouch technique is preferred.
2. Cosmetic concerns: Some boys have body image issues following orchidectomy and request surgery for a testicular prosthesis. Implants are saline-filled with a silicone shell or a silicone elastomer envelope filled with a highly resilient silicone gel [8]. Whilst important cosmetic and psychological benefits can be gained from surgery not all patients are satisfied with the results – 23 % claiming the prosthesis is too small, 38 % feeling it is too heavy and 38 % stating it's position is too high in the scrotum [8, 9].
3. Future fertility: Paternity in adult life is close to normal for boys undergoing orchidectomy for a dysplastic testis and normal contralateral testis [3]. Testicular torsion in teenagers and young adults seriously affects spermiogenesis in about half the patients and on long term follow up only 5–50 % have normal semen analysis [10]. Although robust data are lacking prepubertal boys may fair better with regard to future paternity [11].

References

1. Ein SH, Nasr A, Wales PW, Ein A. Testicular atrophy after attempted pediatric orchidopexy for true undescended testis. J Pediatr Surg. 2014;49:317–22.
2. Kozminski DJ, Kraft KH, Bloom DA. Orchiopexy without transparenchymal fixation suturing: a 29-year experience. J Urol. 2015;194:1743–7.

3. Jungwirth A, Diemer T, Dohle GR et al. Guideline on male infertility. Eur Assoc Urol. 2014. www.uroweb.org.
4. Lip SZ, Murchison LE, Cullis PS, Govan L, Carachi R. A meta-analysis of the risk of boys with isolated cryptorchidism developing testicular cancer in later life. Arch Dis Child. 2013;98:20–6.
5. Harper L, Gatibelza ME, Michel JL, Bouty A, Sauvat F. The return of the solitary testis. J Pediatr Urol. 2011;7:534–7.
6. Belman AB, Rushton HG. Is the vanished testis always a scrotal event? BJU Int. 2001;87:480–3.
7. Nason GJ, Tareen F, McLoughlin D, McDowell D, Cianci F, Mortell A. Scrotal exploration for acute scrotal pain: a 10-year experience in two tertiary referral paediatric units. Scand J Urol. 2013;47:418–22.
8. Kogan S. The clinical utility of testicular prosthesis placement in children with genital and testicular disorders. Transl Androl Urol. 2014;3:391–7.
9. Zilberman D, Winkler H, Kleinmann N, Raviv G, Chertin B, Ramon J, Mor Y. Testicular prosthesis insertion following testicular loss or atrophy during early childhood – technical aspects and evaluation of patient satisfaction. J Pediatr Urol. 2007;3:461–5.
10. Visser AJ, Heyns CF. Testicular function after torsion of the spermatic cord. BJU Int. 2003;92:200–3.
11. Puri P, Barton D, O'Donnell B. Prepubertal testicular torsion: subsequent fertility. J Pediatr Surg. 1985;20:598–601.