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ASCENT OF THE TESTIS REVISITED: FACT NOT FICTION

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Sir,

We read this paper [1] with great interest. We fully agree that acquired undescended testis (UDT) is a frequent phenomenon which was until recently, heavily under-rated. Acquired UDT has been found to occur in 1.5% of unselected boys [2], thereby outnumbering congenital UDT. Acquired UDT is now recognised as the major cause behind the high rate (1–2%) of orchidopexies occurring later in childhood. Several retrospective studies showed that as many as 70–80% of orchidopexies are for previously descended testes. A recent, and until now, the only prospective study, confirmed that recognition of acquired UDT might reduce the total number of early and late orchidopexies by 60% [3].

The pathogenesis of acquired UDT remains unclear, but failure of natural growth of the spermatic cord, probably due to a fibrous remnant of the processus vaginalis, might play a role. We recommend avoiding the term 'ascending testis', as it implies an active 'climbing' of the testis to the groin, whereas in fact this is probably a passive process. The prognosis and optimum treatment of acquired UDT remains an unresolved issue. Taghizadeh *et al.* [1] recommended (immediate) surgical intervention after the diagnosis, based solely on histological data provided by Rusnack *et al.* [4]. We believe that this recommendation should be reconsidered for several reasons. First, Taran *et al.* [5] recently questioned the findings of Rusnack *et al.*, because 43% of the ascending group had a patent processus vaginalis, suggesting that many of these were primarily congenital. Second, it remains to be seen whether orchidopexy will improve histological abnormalities or at least prevent further worsening. Third, there are, as far as we know, no long-term follow-up studies on testicular function after prepubertal orchidopexy. In 101 boys who had undergone prepubertal orchidopexy in 1986–1999, with 122 acquired UDT (46 right-sided, 34 left-sided, 21 bilateral), we assessed long-term testicular growth using the Prader orchidometer. Of 120 testes, 31 (25.8%) had a testis volume of more than the 50th percentile according to age and in 89 cases (74%) a testis volume ≤50th percentile, of which 43 (35.8%) were ≤10th percentile. (In two cases testis volume could not be measured). In 80 of these boys, in whom unilateral orchidopexy had been performed, 25 of 77 testes (32.5%) showed no difference in testicular volume between the operated and non-operated gonads. However, in 39 testes (50.6%) the operated testes were ≥2 mL smaller. (In three cases, testis volume could not be measured). These findings indicate that routine use of orchidopexy for acquired UDT might not be beneficial in terms of long-term testicular growth (unpublished data). Fourth, acquired UDT has a 57–76% tendency of spontaneous descent during puberty [6,7], making immediate prepubertal surgery, as recommended by Taghizadeh *et al.*, unnecessary. Fifth, Chilvers *et al.* [8] showed that early rather than late operations on boys aged 4–14 years had no effect on subsequent fertility. Although congenital and acquired UDT were not recognised separately, these findings might indicate that postponing surgery until at least puberty will not adversely affect testicular function. Finally, orchidopexy carries with it a 5–6% risk of vascular damage to the gonad, leading to loss of testis tissue in the long-term [9].

In accordance with a recently developed guideline for the Youth Health Care Institutions in our country, and in light of the above mentioned reasons, we recommend being more conservative when deciding on surgery in the prepubertal period. In our opinion, orchidopexy is only warranted in the (mid-)pubertal period in case of non-descent. We speculate that this policy might lead to an improvement in fertility outcomes, which is one of the major goals of the treatment of UDT.

1 **Taghizadeh AK, Thomas DF.** Ascent of the testis revisited: fact not fiction. *BJU Int* 2008;**102**: 676–8
2 **Hack WW, Sijstermans K, van Dijk J, van der Voort-Doedens LM, De Kok ME, Hobbelt-Stoker MJ.** Prevalence of acquired undescended testis in 6-year, 9-year and 13-year old Dutch schoolboys. *Arch Dis Child* 2007; **92**: 17–20
3 **Hack WW, van der Voort-Doedens LM, Sijstermans K, Meijer RW, Pierik FH.** Reduction in the number of orchidopexies for cryptorchidism after recognition of acquired undescended testis and implementation of expectative policy. *Acta Pediatr* 2007; **96**: 915–8
4 **Rusnack SL, Wu HY, Huff DS *et al.*** The ascending testis and the testis undescended since birth share the same histopathology. *J Urol* 2002; **168**: 2590–1
5 **Taran I, Elder JS.** Results of orchiopexy for the undescended testis. *World J Urol* 2006; **24**: 231–9
6 **Eijsbouts SW, de Muinck Keizer-Schrama SM, Hazebroek FW.** Further evidence for spontaneous descent of acquired undescended testes. *J Urol* 2007; **178**: 1726–9
7 **Sijstermans K, Hack WW, van der Voort-Doedens LM, Meijer RW, Haasnoot K.** Puberty stage and spontaneous descent of acquired undescended testis: implications for therapy? *Int J Androl* 2006; **29**: 597–602
8 **Chilvers C, Dudley NE, Gough MH, Jackson MB, Pike MC.** Undescended testis: the effect of treatment on

subsequent risk of subfertility and malignancy. *J Pediatr Surg* 1986; **21**: 691–6

9 **Docimo SG.** The results of surgical therapy for cryptorchdism: a literature review and analysis. *J Urol* 1995; **154**: 1148–52

Reply

We were interested to read the comments of Hack *et al.*, whose publications on this topic have helped to raise awareness of the ascending testis. They dislike the term 'ascending testis', preferring 'acquired UDT'. Whatever the underlying cause of this phenomenon, the net effect is that the testis ascends in relation to adjacent anatomical structures, and for this reason the term 'ascending' seems appropriate. In practice, such semantic considerations are largely irrelevant as, by common usage, 'ascending testis' has now become firmly established in the urological vocabulary.

Hack *et al.* take issue with our conclusion that the available evidence now favours surgical intervention (orchidopexy) in preference to a 'wait and see' approach for managing high retractile or ascending testes. We were puzzled by their assertion that this recommendation was based 'solely on histological data provided by Rusnack *et al.*' as the section of our article devoted to fertility includes references to four other relevant publications. Ideally we would considered fertility at greater length but were constrained by the limit on word count and references.

They cite a 5–6% risk of postoperative vascular atrophy as an argument in favour of 'wait and see' management rather than orchidopexy for ascended testes. The reference to Docimo's 1995 paper to support this value is surprising, as Docimo's meta-analysis makes no specific reference to vascular atrophy risk, referring only to successful or unsuccessful orchidopexy rates. Moreover, the results of a historical retrospective literature review spanning 70 years are of arguable relevance to current specialist practice, and Docimo's outcome data make no distinction between ascending testes and congenital UDT. In our experience mobilisation of the spermatic cord is relatively straightforward in older boys with ascending testes by comparison with infants whose congenital UDTs are characterised by delicate cord structures and a patent processus. In specialist hands the atrophy risk should be significantly lower than the value they suggest.

The implications for fertility and testicular growth of retractile testes are well documented and, by extrapolation, it is reasonable to assume that ascending testes which are retained in the groin are likely to be equally if not more susceptible to similar changes. The impact of high retractile or ascended testes on fertility has been the subject of an authoritative and detailed analysis by Hutson [1], who has concluded, "even in late childhood 5–10 years of nonscrotal position causes secondary degeneration of the testes".

Deferring orchidopexy until after puberty is also not without risk. In a very large cohort of nearly 17 000 men who had a long-term follow-up after orchidopexy, men who had undergone orchidopexy after the age of 13 years had double the relative risk of developing testicular cancer than those who had undergone orchidopexy before reaching the age of 13 years [2]. Although congenitally undescended and ascending testes were not distinguished, the findings suggest that deferring orchidopexy carries significant implications for those who eventually come to surgery.

In summary, we believe the weight of available evidence now indicates that the 'wait and see' approach advocated by Hack *et al.* represents a higher risk than orchidopexy in individuals with ascending testes.

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1 **Hutson JM.** Undescended testes in paediatric surgery and urology: long term outcomes. In Stringer M, Oldham K, Mouriquand P, eds. Cambridge: Cambridge University Press, 2006: 652–63

2 **Pettersson A, Richiardi L, Nordenskjold A, Kaijser M, Akre O.** Age at surgery for undescended testis and risk of testicular cancer. *NEJM* 2007; **356**: 1835–41

CHANGES IN BODY COMPOSITION: MUSCLE FUNCTION AND ENERGY EXPENDITURE AFTER RADICAL CYSTECTOMY

Sir,

We read with great interest this recent article on the impact of radical cystectomy on body composition [1]. The current study confirms that patients are often malnourished before surgery, endure significant protein loss (which takes several months to recover) and increased energy expenditure after surgery. The study adds to previous data in other surgical fields showing that inadequate preoperative dietary intake, surgical injury and immobilisation depletes carbohydrate stores, switches metabolism to a catabolic state and leads to postoperative insulin resistance, resulting in poor wound healing and increased risk of infective complications [2]. These observations have contributed to the development of Enhanced Recovery After Surgery (ERAS) protocols, which challenge more traditional views on peri-operative nutrition [3]. The aims of these protocols are to develop key elements of peri-operative care to improve clinical outcomes.

As a result of observations on the effect of major surgery on metabolism we now use the Malnutrition Universal Screening Tool [4] to identify those patients who would benefit from specialist dietary input before surgery. We 'load' our patients orally with carbohydrate 24 h and until 2 h before surgery, and institute slow enteral feeding 2 h after surgery. These measures, as part of ERAS, aim to ensure that patients are in an anabolic state at the time of surgery, their glycogen stores are full, and there is a reduction in postoperative insulin resistance and loss of lean muscle mass. There is growing evidence in colorectal surgery that integrated multimodal approaches to peri-operative care can result in an overall enhancement of recovery. The effects on major morbidity and mortality remain to be determined, but our initial observations, together with reports from other urology centres using these approaches, are encouraging [5].

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1 **Mathur S, Plank LD, Hill AG, Rice MA, Hill GL.** Changes in body composition, muscle function and energy expenditure after radical cystectomy. *BJU Int* 2008; **101**: 973–7
2 **Svanfeldt M, Thorell A, Hausel J, Soop M, Rooyackers O, Nygren J, Ljungqvist O.** Randomized clinical trial of the effect of preoperative oral carbohydrate treatment on postoperative whole-body protein and glucose kinetics. *BJS* 2005; **94**: 1342–50
3 **Fearon K, Ljungqvist O, Von Meyenfeldt M *et al.*** Enhanced recovery after surgery: A consensus review of clinical care for patients undergoing colonic resection. *Clin Nutrition* 2005; **24**: 466–77
4 **British Association for Parenteral and Enteral Nutrition (BAPEN).** Available at http://www.bapen.org.uk/must_tool.html
5 **Mariappan P, Sinclair CG, Duffus T.** ERAS protocol in patients undergoing radical cystectomy for bladder cancer – a prospective controlled study of surgical outcomes. BAUS Manchester 2008 Abstract U19

A NOVEL MIDSTREAM URINE-COLLECTION DEVICE REDUCES CONTAMINATION RATES IN URINE CULTURES AMONGST WOMEN

Sir,

With reference to this article by Jackson *et al.* [1], the authors found significant reductions in contamination rates of urine samples of 31% and of spillage of urine (on hands, clothes and floor) of 41%. The authors found these reductions occurred with the use of the CleanCatch™ Midstream, a novel midstream urine-collection device, that is sterile (10^{-6} probability of non-sterile unit, PNSU). However, the authors did not investigate what happens once a contaminated sample has been identified, or the link, if any, between contamination rates and the incidence of hospital-acquired infections (HAI) including *Clostridium difficile* infection (CDI).

In fact, current investigation shows a potential profound link between contamination rates and the incidence of HAI, and we suggest that the procurement officer plays a central role in influencing the incidence of HAI (including CDI). Has the role of the procurement officer one that has hitherto been overlooked?

It is a clearly accepted view that broad-based antibiotic prescription increases the incidence of HAI. BSOP 10 states: 'The incidence of [CDI] has been shown to decrease once antibiotic therapy is controlled' [2]. What influence does the procurement officer have on the rate of broad-based antibiotic prescription? This issue has not been addressed in any papers to date.

Informal discussions with some 30 clinicians show that when faced with a contaminated sample they will normally prescribe rather than retest, and such prescription would be a broad-based antibiotic. This is especially true in busy environments and is even the case where re-testing is mandatory under National Institute of Health and Clinical Excellence (NICE) guidelines [3], because a false-positive result coupled with a broad-based antibiotic prescription can have adverse effects leading to premature birth. (A false-positive result can lead to a HAI outbreak, as it will lead to unnecessary treatment for some of the patients, e.g. trimethoprim and/or ciprofloxacin. This treatment will cause side-effects, needing further treatment in a proportion of patients, i.e. piriton for the rash, fluconazole for thrush, metronidazole for CDI. If you are really unlucky, the CDI will escalate into an outbreak).

The question now arises as to what causes these contaminated samples? Leaving aside faulty collection procedures and substandard laboratory practice, this is where the role of the procurement officer becomes crucial. The procurement officer decides what equipment is purchased and so is faced with a simple cost choice: a sterile container (10^{-6} PNSU) at ≈£1.00 retail or a non-sterile container (≤10^{-3} PNSU) at ≈20 p retail. (European Standard EN 554: 1994 defines a sterile product as one that is 'free from viable micro-organisms'). With some hospitals doing ≈100 000 tests annually, choosing the cheaper non-sterile unit can amount to substantial 'unit cost savings' (especially if there is a bulk discount for the non-sterile product).

We draw evidence from two sources to support the importance of the procurement officer, one obviously being the results of the clinical trials conducted by Jackson *et al.* Second is the experience of the Oxford Radcliffe Hospital (ORH); during the trials by Jackson *et al.* the ORH used a sterile container (costing £1.13 per unit) but in 2007 the procurement officer issued instructions to change to a non-sterile container (costing 6p per unit). (The use of non-sterile containers for urine sample collection is strictly forbidden by UK and European Union legislation). By the end of the year the CDI rate at the ORH had, according to press reports, increased by 30%, while at the same time the contamination rates had increased by >22% (Freedom of Information requests, FOI). The ORH has refused further FOI requests to supply information on the data that might assist in interpreting these values (subject to an appeal to the FOI commissioner, which can take 2 years).

Whilst there is no confirmed direct link between the increase in contamination rates and CDI rate, there is no doubt that a contaminated sample will meet with one of two results, i.e. a re-test or antibiotic prescription. There are no data on the number of re-tests, with most laboratories simply treating the re-test as a new test, but the preponderance of replies is clearly that clinicians will prescribe a broad-based antibiotic rather than re-test. Thus a reduction in contamination will lead to a reduction in the incidence of CDI.

Incidence of contamination when a sterile device (10^{-6} PNSU) vs an aseptic device (10^{-3} PNSU) is used is highly significant. The BSI standard [4] sets out the semiquantitative probability range in table D4, where in common terms the scales for probability can include 'probability of harm per use' and 'probability of harm per device'. An aseptic rating of 10^{-3} PNSU translates as 'frequent' whereas 10^{-6} translates to 'improbable'. Sterile means that it is controlled to a guaranteed level of contamination rate of 1 per million. It is then, by definition of control, 'improbable' that there will be any contamination in the container that is sterile (improbability = >1 per million). Aseptic means that it is controlled to a level of contamination rate of 1/1000. It is then, by definition of control, 'frequent' that there will be contamination in the container that is aseptic (frequent = >1/1000 and to ≤1/10 000). Sometimes with *in vitro* devices the term 'clinical clean' is used, but this term has no sterility significance and is probably a marketing term. It is equivalent to unsterile and not to aseptic, which has a sterility reference.

It is possible that readers might indeed have statistics or would like to clinically trial the

issues set out here, based on the facts accumulated. First, what does the clinician do in terms of percentages when confronted with a contamination urine sample: re-test or prescribe? (To do nothing is not an option under NICE Guidelines.) Second, will a reduction in contaminated samples result in a reduction in broad-based antibiotic prescription? The authors would welcome any comments from readers either via the journal or directly, to set in motion a fuller investigation, if not a trial, on these issues.

Historically most collection points (i.e. hospitals) used sterile containers for urine collection in microbiological examination. The trend, introduced by procurement officers, has been to move away from sterile containers towards non-sterile containers, despite the European and UK regulations making sterility mandatory when culture of the specimen is involved. This appears to be matched by an increase in HAI (including CDI). A FOI request to the NHS Supply chain showed that in 1999, 80.62% of urine sample collections were non-sterile, while in 2007 this had increased to 91.97%. Between 1999 and 2007 the incidence of CDI increased dramatically. (Data before 1999 were not available)

In accordance with the *BJU Int* code of conduct we wish to declare an interest in the subject, in that Orde Levinson is the inventor of the CleanCatch Midstream device used in the clinical trials by Jackson *et al.* Furthermore, Joseph Delo, while currently a medical student at Oxford University, has taken a summer job during 2008 with the company of the CleanCatch Midstream. Other than this, no influence was or could have been brought to bear on the information above.

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1 **Jackson SR, Dryden M, Gillett P, Kearney P, Weatherall R.** A novel midstream urine collection device reduces contamination rates in urine cultures amongst women. *BJU Int* 2008; **96**: 360–4
2 **Health Protection Agency.** *National Standard Method for Processing of Faeces for* Clostridium difficile. BSOP 10; January 2008
3 **NICE.** Guidelines: Antenatal care: Routine care for healthy pregnant women. Clinical Guidance 6; October 2003
4 **BSI.** Medical devices. Application of risk management to medical devices. BS EN ISO 14971: 2007; April 2007.