Clinical audit

Management of inguinal herniae in patients on continuous ambulatory peritoneal dialysis: an audit of current UK practice

G J Morris-Stiff, D J Bowrey, W A Jurewicz, R H H Lord

Summary

Patients receiving continuous ambulatory peritoneal dialysis are at increased risk for the development of inguinal herniae, with a reported prevalence of 14%. Elective hernia repair is indicated for these patients as strangulation is associated with a high mortality in this population. There are currently no national guidelines relating to the optimal peri-operative management of these patients, in particular the appropriate pre- and post-operative dialysis regimen. The aim of the current study was to evaluate current practice in the UK by means of a postal questionnaire sent to all centres undertaking renal transplantation. Replies were received from 34/37 centres. The principal study finding was the wide variation in surgical practice between different centres with regard to pre- and post-operative dialysis regimes. Only 44% of centres had an established protocol. Based upon the study findings we have devised a protocol that we hope to see implemented into UK practice. Following its introduction, a re-assessment will be performed and the audit cycle completed.

Keywords: inguinal hernia; dialysis; clinical audit

It is recognised that patients receiving continuous ambulatory peritoneal dialysis (CAPD) are at increased risk for the development of inguinal herniae, with a reported prevalence of 14%.¹ Most authors would advocate elective hernia repair for these patients, as strangulation is associated with a high mortality in this population.² The optimal peri-operative management of these patients is unclear as there are currently no national guidelines. In particular, there are no recommendations regarding amendments to the pre- and post-operative dialysis schedules. The aim of the current study was to evaluate current practice in the UK and, based upon this information, to formulate a management protocol.

Methods

All UK centres undertaking elective renal transplantation were identified from the UK Transplant Register and a postal questionnaire sent to the lead transplant surgeon at each

institution. The questions covered the following: whether there was a unit policy regarding the management of CAPD patients with inguinal herniae; if and how patients' dialysis regimes were altered prior to and following hernia repair; if imaging was undertaken pre-operatively; if prophylactic antibacterials were given peri-operatively and the type of hernia repair undertaken.

Results

Replies were received from 34 of the 37 UK transplant centres (table). Two centres had no experience with inguinal herniae arising in patients receiving CAPD and were thus excluded from the analysis. The median number of patients undergoing hernia repair at each centre was five per annum (range 1–20).

Eleven centres (34%) altered patients' dialysis schedule pre-operatively. Six centres converted patients to haemodialysis pre-operatively for a median of 2 days (range 1–14 days). Two of these centres routinely converted to haemodialysis and the other four centres converted to haemodialysis for those patients with unstable renal function. Three centres reduced the volume of dialysate exchanged, one centre converted patients to chronic cycling peritoneal dialysis and one centre increased the number of exchanges from four to five per day for the three pre-operative days. The remaining 21 centres made no alteration to their pre-operative dialysis routine except to ensure that patients had their peritoneal cavities free of dialysate at the time of surgery.

Ten centres recommenced CAPD on the first post-operative day. The remaining 22 centres utilised a temporary haemodialysis line inserted pre-operatively. For these patients, there was wide variation in the duration of haemodialysis before CAPD was re-introduced, the median time was 4 weeks (range 1 day to 8 weeks).

Discussion

The principal study finding is the wide variation in surgical practice between different UK centres with regard to the management of CAPD patients undergoing repair of inguinal herniae. Only 14 centres (44%) had an established protocol relating to the pre-operative and post-operative management of these patients.

Department of
Transplant Surgery,
University Hospital of
Wales, Heath Park,
Cardiff, CF4 4XN, UK
G J Morris-Stiff
D J Bowrey
W A Jurewicz
R H H Lord

Accepted 8 July 1998

Table Study questionnaire and results

	Yes (%)
Do you treat inguinal herniae in CAPD patients ?	32/34 (94)
Do you have a protocol for their pre-operative management ?	14/32 (44)
If you operate such a protocol	
Do you alter the CAPD regimen prior to surgery ?	11/32 (34)
Do you convert to haemodialysis prior to surgery ?	6/32 (19)
Do you undertake any imaging studies prior to surgery ?	
Routinely ?	0/32 (0)
When the diagnosis is unclear ?	9/32 (28)
If yes what investigations do you perform ?	
Isotope scan	4/9 (44)
Peritoneogram	5/9 (56)
Do you routinely give prophylactic antibacterial cover ?	23/32 (72)
For unilateral hernias do you repair the contralateral side ?	2/32 (6)
What method of repair do you routinely undertake ?	
Darn repair	21/32 (66)
Mesh repair	11/32 (34)
Do you have a post-operative management protocol ?	32/32 (100)
If you operate such a protocol do you convert to haemodialysis ?	22/32 (69)

Peri-operative management protocol for CAPD patients undergoing inguinal hernia repair

- CAPD may be continued until the day of surgery, thus ensuring optimal electrolyte status
- dialysate should be removed from the peritoneal cavity immediately prior to surgery
- temporary haemodialysis lines should be inserted per-operatively and haemodialysis continued for 4 weeks
- the administration of prophylactic antibacterials per-operatively are recommended
- pre-operative imaging should be reserved for those patients in whom the diagnosis is unclear
- the use of a prosthetic mesh cannot be recommended as the method of choice. Mesh repair may be appropriate for recurrent inguinal herniae

The sustained increase in intra-abdominal pressure is believed to be the main aetiological factor underlying the high frequency of inguinal herniae in CAPD patients.³ The processus vaginalis, patent at birth in 90% of male infants but patent in only 20% of adults⁴ is re-opened by the pressure generated by the dialysate during the dwell cycles of the exchange. The importance of this chronically raised intra-abdominal pressure was demonstrated by Twardowski *et al.*,³ who recorded mean increases in intra-abdominal pressure of 2.0, 2.7 and 2.8 cm water per litre of dialysate infused in the supine, upright and sitting postures, respectively. Further, we have previously shown that amongst patients receiving

CAPD, those with autosomal dominant polycystic kidney disease are the group most likely to be affected by abdominal wall herniae.⁵

The management protocol for patients receiving CAPD undergoing inguinal hernia repair, based upon the consensus opinion of UK transplant surgeons, is shown in the box. Each recommendation is based upon the practice of at least two-thirds of UK transplant centres (range 66–100%).

We hope to see the proposed guidelines implemented into UK practice with view to a re-evaluation of national practices in one year's time and a completion of the audit cycle.

- 1 Rocco MV, Stone WJ. Abdominal hernias in chronic peritoneal dialysis patients: a review. *Perit Dial Bull* 1985;3:171–4.
- 2 Moffat EL, Deitel M, Thompson DA. Abdominal surgery in patients undergoing long-term peritoneal dialysis. *Surgery* 1982;92:598–604.
- 3 Twardowski ZJ, Prowant BJ, Nolph KD, Martinez AJ, Lampton LM. High volume, low frequency continuous ambulatory peritoneal dialysis. *Kidney Int* 1983;23:64–70.

- 4 Wesley JR. The pediatric abdomen. In: Greenfield LJ, Mulholland MW, Oldham KD, Zelenock GB, eds, *Surgery - scientific principle and practice*. Philadelphia: JB Lippincott Company, 1994; pp 1832–8.

- 5 Morris-Stiff G, Coles G, Moore R, Jurewicz A, Lord R. Abdominal wall hernia in autosomal dominant polycystic kidney disease. *Br J Surg* 1997;84:615–7.