

Hospital Practice

Bilateral inguinal hernias: simultaneous or sequential repair?

M.A. Stott, R. Sutton and G.T. Royle

Royal South Hampshire Hospital, Graham Road, Southampton SO9 4PE, UK.

Summary: Two hundred and forty four patients underwent either simultaneous bilateral inguinal hernia repair ($n=122$) or unilateral inguinal hernia ($n=122$) repair at a general hospital between January 1971 and December 1981. The two groups of patients were matched for age and sex. Both groups had a similar overall incidence of post-operative complications and in both groups the duration of post-operative stay and duration of operating time were similar. Chest infections developed in 12 patients after bilateral repair and in 3 patients after unilateral repair ($P<0.02$).

All patients were assessed prospectively from 4 to 15 years after operation, when no significant difference in the number of recurrent hernias was found.

Our results suggest that simultaneous bilateral inguinal herniorrhaphy is economical in terms of both operating time and duration of hospital stay, and that this economy is not bought at a cost of increased short term morbidity or long-term recurrence rate.

Introduction

Bilateral inguinal hernias may be repaired at one operation, or on two separate occasions, i.e. sequentially. Simultaneous repair is more convenient and economical, since only one admission, anaesthetic and period of convalescence are usually required, but simultaneous repair has been thought to result in a higher incidence of post-operative complications.^{1,2} Previous studies have shown no increase in post-operative complications following simultaneous bilateral repair when compared to unilateral repair,^{3,4} but have not investigated hernia recurrence rates on a prospective basis. We have studied the incidence of both early and late post-operative complications following simultaneous bilateral inguinal hernia and unilateral hernia repair, to assess the safety and long-term outcome of simultaneous bilateral inguinal hernia repair.

Patients and methods

Three hundred and seventy five patients underwent elective inguinal hernia repairs under general

anaesthetic at the Royal South Hants Hospital between January 1971 and December 1981 and were firstly studied by retrospective analysis of their case notes. Sixty-seven of these patients who could not be traced or did not attend for long-term follow-up were excluded from further analysis. In the remainder simultaneous bilateral repairs were performed on 122 patients, while unilateral repairs were performed on 186 patients. As both age and sex have been found to affect hernia recurrence rates,⁵ a group of 122 patients was selected from the 186 who had undergone unilateral repairs to match the 122 who had undergone bilateral repairs for age and sex. The matching was performed by adjusting the numbers of patients in each decade of the unilateral group and by excluding 16 of the 18 women. The exclusions were chosen at random within each decade by an author without knowledge of the patients' results or clinical details. The groups, once matched for age and sex, were found to be well matched for pre-existing respiratory disease, recurrent hernias at presentation, the status of surgeon performing the repairs and for length of follow-up. The 64 unmatched patients were not included in the results.

At operation the nature of each hernia was noted and a non-absorbable monofilament darn or Bassini repair fashioned in all but a few cases. After

Correspondence: M.A. Stott, F.R.C.S., Clinical Investigation Unit, Ham Green Hospital, Pill, Bristol BS20 0HW, UK

Accepted: 6 January 1988

operation, wound haematoma was recorded if obvious bruising occurred, while wound infection was identified by the presence of cellulitis or pus. Chest infection was identified by purulent sputum, clinical signs or chest X-ray findings. All other complications were recorded when clinically evident.

A prospective review of all 244 matched patients was carried out 4 to 15 years after operation. Forty-five patients had already re-presented with recurrent hernias. The remaining 199 patients were contacted and invited to attend an outpatient clinic. Eighty-seven patients (46 following bilateral repairs, 41 following unilateral) were examined in the clinic whilst 112 patients (46 following bilateral repairs, 66 following unilateral) replied by letter stating that they had no recurrence but declined to attend the clinic. Recurrent hernias not previously operated on

were diagnosed by examination when an expansile cough impulse was present.⁶

The results were analysed using the Chi square test and Wilcoxon rank sum test.

Results

The clinical features, operative details and length of follow-up of the 244 matched patients undergoing simultaneous bilateral or unilateral inguinal hernia repairs are listed in Table I, while their post-operative complications are listed in Table II. The two groups of patients are well matched but for 148 direct inguinal hernias in the bilateral group compared to 33 in the unilateral group (Chi square, $P < 0.001$).

Table I Clinical features, operative details and length of follow-up on 244 patients undergoing simultaneous bilateral or unilateral herniorrhaphy

	<i>Bilateral</i>	<i>Unilateral</i>	<i>P value</i>
Number of patients	122	122	—
Number of hernias	244	122	—
Median age in years (range)	59 (26–84)	59 (22–80)	ns
Men: women	120:2	120:2	ns
Chronic respiratory disease	17	10	ns
Recurrent hernias at presentation	15	6	ns
Direct: indirect hernias	148:82	33:76	<0.001
Pantaloon hernias	14	13	ns
Senior surgeon/junior surgeon*	112:132	46:76	ns
Darn: Bassini repairs	196:32	105:12	ns
Median operating time in min (range)	45 (20–120)	35 (15–85)	<0.05
Median post-op stay in days (range)	3 (1–15)	3 (1–7)	ns
Median follow-up in years (range)	6 (4–14)	7 (5–14)	ns

ns = not significant.

*Senior surgeon = consultant or senior registrar; junior surgeon = registrar or junior house officer.

Table II Post-operative complications of 244 patients following simultaneous bilateral or unilateral repair

	<i>Bilateral</i>	<i>Unilateral</i>	<i>P value</i>
Number of patients	122	122	—
Wound haematoma	6	5	ns
Wound infection	12	10	ns
Scrotal oedema	4	4	ns
Urinary retention	1	2	ns
Chest infection	12	3	<0.02
Deep vein thrombosis	2	0	ns
Stitch sinus	3	2	ns
Recurrent hernias	46 (of 244)	18 (of 122)	ns

The recurrences listed in this table do not include 21 recurrent hernias found on presentation (see Table I) prior to the repairs featured in this study.

Chest infections were noted significantly more often after bilateral repair than after unilateral repair. Neither age nor pre-existing respiratory disease appeared to be related to the development of post-operative chest infection. The rates of all other early post-operative complications were not significantly different between the two groups, both when analysed per hernia and when analysed per patient.

Recurrent hernias developed in 38 patients following bilateral repair: 8 of these patients developed bilateral recurrences. There was no significant difference between these 46 recurrences (18.8%) following 122 bilateral repairs (244 hernias) and 18 recurrences (14.7%) following 122 unilateral repairs. The median time of recurrence was two years after operation in both groups. Fourteen recurrences which had not previously been operated on were identified when patients reattended for long-term follow-up.

In all patients 19.6% of direct hernias and 15.8% of indirect hernias recurred. This difference is not statistically significant. The incidence of complications amongst all patients who had only direct inguinal hernia repairs (63 patients who underwent bilateral repair, 33 unilateral repair) was 24%. This was not significantly different from that amongst all patients who had only indirect repairs (21%) (21 patients who had bilateral repairs, 76 unilateral repairs).

Of the 64 patients excluded by the age/sex matching procedure there were 48 male patients (median age 36 years, range 17–55) and 16 female patients (median age 52 years, range 35–86). There were 4 recurrent hernias and 6 wound infections in the male patients and 2 wound infections and no recurrent hernias in the female patients excluded. There were no other complications in this group.

The median duration of post-operative stay was 3 days for both groups. The duration of the operation was 45 minutes (range 20–120) for the bilateral group, significantly longer than but not twice that of the unilateral group (35 minutes, range 15–85).

Discussion

In this study patients undergoing unilateral inguinal hernia repair were matched with patients undergoing bilateral repair to minimize the effects of age, sex, preexisting chronic respiratory disease, surgical experience, type of repair and length of follow-up. The rates of complications and recurrences following either unilateral or bilateral direct inguinal hernia repair were not significantly

different from those following either unilateral or bilateral indirect hernia repair, suggesting that the unequal distribution of direct and indirect hernias between the two matched groups had little effect on complication rates.

The main advantage of simultaneous over sequential bilateral inguinal hernia repair is that only one admission, anaesthetic, operation and period of convalescence are required, as is the case for many other bilateral procedures, including bilateral inguinal herniotomy in children.⁷ If general anaesthesia is given for sequential bilateral repair an interval of at least a week between operations has been recommended to encourage recovery and mobilization.⁸ When local anaesthetic is used, sequential bilateral repair can be carried out during one admission, but a minimum of 48 hours is necessary between operations to prevent absorption of toxic doses of local anaesthetic.² Both this study and others suggest that even an interval of 48 hours prolongs hospital stay, since no significant difference has been found in post-operative stay following simultaneous bilateral repair when compared to unilateral repair.^{3,4}

If it is allowed that a sequential bilateral hernia repair is equivalent to two unilateral hernia repairs then the figures for operating time and post-operative stay must be doubled to provide appropriate comparison. If this is done the operating time and post-operative stay are significantly less for simultaneous bilateral repair.

In this study chest infection occurred more often following simultaneous bilateral than unilateral repair. The incidence of chest infection has not previously been recorded to be high amongst patients who have undergone simultaneous bilateral repair: this may result from the smaller numbers and younger ages of patients in other studies. Chest infection appears to have been absent or overlooked in some studies: in one study wound infection was the only complication for which numbers were recorded.³ The higher rate of chest infection following bilateral repair probably reflects the longer operating time for a bilateral repair and coughing may be more inhibited following bilateral repair. It would seem prudent to repair bilateral inguinal hernias sequentially if difficulty is experienced during the repair of the first side as might occur in the presence of obesity or pre-existing recurrence since under such circumstances simultaneous repair is likely to be prolonged. Similarly it may be prudent to repair sequentially bilateral hernias in patients with chronic obstructive airways disease to reduce the risk of post-operative chest infection.

Few detailed comparisons of the recurrence rates following bilateral and unilateral inguinal hernia

repairs have previously been made.^{3,4,9} In these studies the matching of the patients has been limited and recurrence rates have not been assessed prospectively. Ger *et al.* found similar recurrence rates amongst 41 patients following simultaneous bilateral repair as amongst 41 patients following sequential bilateral repair but did not state how recurrences were defined or identified, nor the length of follow-up in the two groups of patients.⁹ Duvie reported similar data after a shorter period of between 2 and 6 years on 141 patients who underwent simultaneous bilateral repair and 141 patients who underwent unilateral repair.⁴ Glassow presented a large personal series in which recurrences following sequential bilateral repair were more frequent than following unilateral repair but again did not state how recurrences were defined or identified.² Our results show a similar trend but the difference is not statistically significant.

The hernia recurrence rates recorded in this study were high, as in previous studies from other institutions where a number of surgeons carried out the repairs.^{5,6,10} Both the definition and method of identification of recurrences used in this study may have resulted in a relative increase in our recorded recurrences. A recurrent hernia which had not been previously operated on was defined as an expansile cough impulse,⁶ and not a defect requiring operation or truss.⁵ Patients with such an expansile cough impulse may not need an operation or a

truss. Furthermore, unlike previous studies all patients were assessed prospectively, excluding any patients on whom prospective follow-up data could not be obtained. Nevertheless there is a marked contrast between the results of most institutional^{5,6,10} and personal^{1,2} series, suggesting that hernia repair commonly requires closer audit.

Retrospective assessment of the incidence of post-operative complications is not ideal as a proportion of the complications will be missed and the diagnostic criteria for each complication are less well defined. In this study the same retrospective technique has been used to assess both groups of patients thus minimizing the limitations inherent in retrospective assessment. However, only a prospective comparison of simultaneous and sequential repair in patients with bilateral hernias will give an unequivocal answer.

This study suggests that simultaneous bilateral inguinal herniorrhaphy is economical in terms of both operating time and hospital stay, and that this economy is not bought at a cost of significantly increased short-term morbidity or long-term recurrence rate.

Acknowledgements

We would like to thank the consultant surgeons of the Royal South Hants hospital for allowing us to include their patients in this study.

References

1. Devlin, H., Russell, I. & Muller, D. Short stay surgery for inguinal hernia. *Lancet* 1977, *i*: 847-849.
2. Glassow, F. Inguinal hernia repair using local anaesthetic. *Ann R Coll Surg* 1984, **66**: 382-387.
3. Soul, J. & Dewar, E. Bilateral inguinal hernia - a reappraisal of dogma. *J Nav Med Serv* 1984, **70**: 160-162.
4. Duvie, S. One-stage bilateral inguinal herniorrhaphy in the adult. *Can J Surg* 1984, **27**: 192-193.
5. Marsden, A. Inguinal hernia. *Br J Surg* 1962, **49**: 384-394.
6. Shuttleworth, K. & Davies, W. Treatment of inguinal herniae. *Lancet* 1960, *i*: 126-127.
7. Rowe, M.I. & Clatworthy, H.W. Jr. The other side of the paediatric inguinal hernia. *Surg Clin North Am* 1971, **51**: 1371-1376.
8. Palumbo, L.T., Sharpe, W.S., Hunter, R.D. & Bernardi, R.S. Primary indirect inguinal hernioplasty: results in 2595 operations. *Surg Clin North Am* 1963, **43**: 1439-1446.
9. Ger, R., Omar, A. & Moza, S. Bilateral adult inguinal hernia. *J R Coll Surg Edinb* 1978, **23**: 300-302.
10. Editorial. Activity and recurrent hernia. *Br Med J* 1977, **2**: 3-4.