

ORIGINAL ARTICLE

NON-LIGATION OF INDIRECT HERNIAL SAC IN CHILDREN

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Background: It is still a matter of debate whether to ligate the indirect hernial sac during herniotomy or leave it open. We designed this study to find out the complications associated with leaving the sac open. **Methods:** This observational study was carried out at Surgical Unit C, Ayub Medical College, Abbottabad from January 2007 to December 2012. The hernial sacs of some children, aged 5 months to 12 years, undergoing herniotomies were left open, and these children were closely followed for development of complications especially early recurrence, due to this non-ligation of hernial sac. **Results:** A total of 23 male children who underwent herniotomies for indirect inguinal hernia and undescended testes were included in the study. No early or late hernia recurrence was observed in these children although minor complications like wound infection and seroma were noted in 2 children. **Conclusion:** Excision of the hernia sac and leaving the stump open is safe and effective with no early recurrence.

Keywords: Non ligation, Hernial sac, Herniotomy.

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INTRODUCTION

Indirect inguinal hernia is common in paediatric age group. It arises due to patent processus vaginalis, a peritoneal channel that has failed to close and is also part of undescended testis in up to 90%. The universal surgical treatment is herniotomy in order to prevent the complications of irreducibility, obstruction and strangulation of the contents which can lead to increased mortality and morbidity.¹

Traditionally in herniotomy, indirect hernial sac is dealt by high ligation of the sac and removal of the redundant part. This step was promoted as essential to avoid recurrence. Early recurrences were attributed to slippage of this ligature.² This view was first challenged in 1978.³ Some authorities¹ are of the opinion that non ligation of the hernial sac is not associated with recurrence of the hernia. Some have even shown adverse events related to hernial sac ligation like increased post-operative pain and discomfort.² There is no consensus on how the hernial sac should be managed. This study was carried out to see whether there is increased recurrence with non-ligation of hernial sac in paediatric age group.

MATERIAL AND METHODS

This observational study was carried out at Surgical Unit C, Ayub Medical College, Abbottabad. The hernial sacs of children, aged 5 months to 12 years, undergoing herniotomies were left open, and these children were closely followed for development of complications due to this non-ligation of hernial sac. We specifically looked for early recurrence. The study was carried out from January 2007 to December 2012. Standard procedure included an inguinal incision, opening of the inguinal canal, separation of the hernial sac from other contents of

the canal, and either high ligation of the sac and excision of the sac, or excision of the sac right up to the mouth and leaving the sac open. Hernial sac was only left open if it slipped from the grasping forceps and could not be retrieved easily. After a short attempt to retrieve the sacs, it was decided to leave the sac open, in the comfort of the belief that evidence is available to support the decision. Part of sac, distal to the mouth, forming a funnel was excised. All surgeries were performed by the same surgical team under general anaesthesia. Local anaesthetic was infiltrated in the wound to reduce post-operative pain. Re-do surgeries, strangulated hernias, torsion of undescended testis and patients who were lost to follow-up or had incomplete records, were excluded from the study. Two doses of prophylactic antibiotics were used. Patients were sent home the same day. Dressing was removed on 10th post-operative day. Absorbable sutures meant there was no need for removal. Follow-up was scheduled upto 3 months for herniotomy and upto 6 months for orchidopexy. They were examined in the outpatients for presence of any complications and specifically for early recurrence of hernia, i.e., reappearance of the hernia within 30 days of the operation. All the data was recorded on a pre-designed *pro forma* and then analysed.

RESULTS

During this 5 year period, 237 herniotomies and 129 orchidopexies were performed in patients of the age group 5 months to 12 years. Out of 237 herniotomies, 9 (3.8%) patients had their hernial sacs left open because it slipped, was very thin, and could not be easily grasped and ligated. During the same period, 21 out of a total of 129 (16.3%) orchidopexies had their sac walls or part thereof slipped or was torn, and

it was difficult to retrieve these. It was observed that a high number of sacs were left open during orchidopexies as compared to herniotomies (16.3% vs. 3.8%).

One out of 9 patients with herniotomy was lost to follow-up and another patient had incomplete record. These patients were excluded from the study. Out of 21 patients with hernial sacs left open during orchidopexies, 5 patients were excluded (3 because they had incomplete records and 2 because they could not come for follow-up). Sixteen patients were included in the study. So a total of 16+7=23 patients were included in the study. All of them were males.

The follow up record of these patients was reviewed for wound infection, hematoma, seroma, post-operative pain, urinary retention, and recurrence in the early follow up. 1 patient developed Superficial Surgical Site Infection (SSSI) and 1 patient developed a seroma/haematoma at the wound site and in the scrotum. Both of these settled with conservative management. The majority of the patients were pain free in the post-operative period and the reason may be that we used local anaesthetic infiltration at the end of the surgery. There were no early recurrences, (Table-1).

Table-1: Non-ligation of hernial sac

| Complications | Study group (n=23) |
|------------------|--------------------|
| SSSI | 4% (n=1) |
| Hematoma/Seroma | 4% (n=1) |
| Early recurrence | Nil |

DISCUSSION

Inguinal hernia is a common condition and for decades surgeons are treating it and endeavouring to achieve the best surgical remedy to it. The history of hernia surgery shows us how much there remains to be learned. The knowledge of the anatomy of the region and mechanics of hernia formation as well as repair are also important aspects of groin hernia.⁴

Herniotomy is considered as the standard surgical procedure for indirect inguinal hernia and as a part of orchidopexy. Traditionally the sac is isolated from the cord structures upto the deep ring, twisted, and redundant sac excised. Stump is transfixed. High ligation of the hernial sac was considered a mandatory step of herniotomy for decades and it was a common perception that early recurrence occurs if a surgeon fails to ligate it properly or a ligature slips off the sac. However this concept has recently been challenged by many.^{1,5}

Ferguson⁶ in 1978 claimed that hernial sac can be left open without increasing the risk of recurrence. After dissecting the hernia sac right up to the deep ring, he excised it and left it open. He followed his patients for a long period, and did not find increased recurrence. Smedberg *et al*⁷ in 1984

showed no significant hernia recurrence after the sac was left open and that leaving the hernia sac open was associated with less post-operative pain. This may be due to the fact that parietal peritoneum is sensitive to pain and a peritoneal ligature may lead to pain.

Similar results were shown by Shulman *et al*.⁸ and Abrahamson⁹ in adults. Kumari *et al*¹⁰ studied non ligation of hernial sac associated with undescended testis and found that hernial sac can be safely left open in such cases as well. Riquelme *et al*¹¹ applied the technique of non-ligation of hernial sac in laparoscopic paediatric inguinal hernia repair. He found that non ligation is as safe in laparoscopic surgery as it is in open indirect inguinal hernia repair.

Healing of peritoneum takes place by the metamorphosis of the in situ mesodermal cells and it is not necessary to approximate the peritoneum at the end of any surgical procedure. Whenever a raw area is created on the peritoneum, the defects close within hours by migration of mesodermal cells. This fact has been studied and proved by many authors like Hubbard *et al*¹² and Ellis¹³. The hernial sac in indirect inguinal hernia is basically a peritoneal diverticulum and the same principles of healing of peritoneum apply to it as well.

Our experience with non-ligation of hernial sac in paediatric age group is so far good with encouraging results. In the 23 children with non-ligation of indirect hernial sac, we did not find early recurrence which was defined as reappearance of the hernia within 30 days of the operation.¹⁴ Although we encountered minor complications like wound infection and seroma in 2 children, but they were not significant and settled with conservative approach. We confirm the findings of others that leaving the indirect hernial sac open is safe. It also reduces the amount of time spend on retrieving a slipped and thin hernia sac.

We observed a high incidence of leaving the sac open in orchidopexies as compared to herniotomies (16.3% vs. 3.8%). This may be due to the fact that the hernial sac associated with undescended testis is not very well developed, thin walled and more vulnerable to tear when attempting at retrieval. Ligation of such sacs is more time consuming while leaving open is safe.¹⁰

CONCLUSION

Non ligation of hernial sac is safe. Leaving the sac open is not associated with early recurrence. Our threshold for leaving the sac open has dropped quite significantly, and we are leaving the sac open more easily since. Further studies are recommended to ensure the utility of this technique in adults.

REFERENCES

1. Mohta A, Jain N, Irniraya KP, Saluja SS, Sharma S, Gupta A. Non-ligation of the hernial sac during herniotomy: a prospective study. *Pediatr Surg Int* 2003;19:451–2.
2. Gharaibeh KI, Matani YY. To ligate or not to ligate the hernial sac in adults? *Saudi Med J* 2000;21:1068–70.
3. Huang CJ, Sun HP. Non ligation of indirect hernia sac in senior male patients with dilated internal ring. *Formosan J Surg* 2013; 46:76–8.
4. McClusky DA 3rd, Mirilas P, Zoras O, Skandalakis PN, Skandalakis JE. Groin hernia: anatomical and surgical history. *Arch Surg* 2006; 141:1035–42.
5. Postlethwait RW. Recurrent inguinal hernia. *Ann Surg* 1985; 202:777–9.
6. Ferguson DJ. Closure of the hernia sac- pro and con. In: Nyphus LM, ed. *Hernia*. 2nd ed. Philadelphia: Lippincott; 1978:152–53.
7. Smedberg SGG, Broomé AEA, Gullmo A. Ligation of the hernial sac? *Surg Clin North Am* 1984;64:299–306.
8. Shulman AG, Amid PK, Lichtenstein IL. Ligation of the hernial sac. A needless step in adult hernioplasty. *Int Surg* 1993;78:152–3.
9. Abrahamson J. *Hernias*. In: Zinner MJ, Schwartz SI, EllisH (eds) *Maingot's abdominal surgery* (10th edn). Prentice Hall, London,1997. pp 479–580.
10. Kumari V, Biswas N, Mitra N, Konar H, Ghosh D, Das SK. Is ligation of hernia sac during orchidopexy mandatory? *J Indian Assoc Pediatr Surg* 2009;14:66–7.
11. Riquelme M, Aranda A, Riquelme QM. Laparoscopic pediatric inguinal hernia repair: No ligation, just resection. *J Laparoendosc Adv Surg Tech A* 2010;20:77–80.
12. Hubbard TB, Khan MZ, Carag VR Jr, Albites VE, Hricko GM. The pathology of peritoneal repair: its relation to the formation of adhesions. *Ann Surg* 1967; 165:908–16.
13. Ellis H, Heddle R. Does the peritoneum need to be closed at laparotomy? *Br J Surg* 1977;64: 733–6.
14. Bisgaard, T, Kehlet H, Bay-Nielsen M B, Iversen MB, Wara P, *et al.* 'Nationwide study of early outcomes after incisional hernia repair.' *Br J Surg* 2009;96:1452–7.

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