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Training

A survey on the current status of laparoscopic training in paediatric surgery in South Africa

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Summary

Objectives. To document the current status of laparoscopic training of paediatric surgical registrars in South Africa.

Methods. An anonymous questionnaire was distributed. Participants were asked to document their involvement in a number of index laparoscopic procedures during the preceding year, as well as additional non-operative training they received and their satisfaction with their training thus far.

Results. All registrars (*N*=16) completed the questionnaire. Registrars were from the Universities of KwaZulu-Natal, Cape Town, Stellenbosch, Pretoria, the Witwatersrand, and Walter Sisulu University. The ratio of consultants proficient in paediatric laparoscopy to registrars was between 0.6 and 1. Junior registrars were more likely to assist with, and senior registrars more likely to perform, procedures. Registrar satisfaction varied greatly across institutions, with 44% of registrars satisfied with their training.

Conclusions. The consultant-to-registrar ratio is favourable, and high patient load provides opportunity for laparoscopic education. However, there are a number of obstacles to adequate training. These include the feasibility of after-hours laparoscopic surgery and the availability and use of training aids. The introduction of a structured training programme across all institutions will improve laparoscopic proficiency and satisfaction among paediatric surgical registrars in South Africa.

Minimal access paediatric surgery is increasingly being performed. Laparoscopic training has therefore become a necessity in the current paediatric surgical registrar syllabus. The change in specialisation from a post-graduate fellowship to a separate post-graduate course has meant that most trainees have little-to-no laparoscopic experience. This study set out to document the current status of laparoscopic training in paediatric surgery in South African institutions.

Methods

A questionnaire was distributed to all registrars attending the Paediatric Surgical Registrar Symposium in October 2009. These were completed and returned. Data included institution and year of training, and the number of consultants involved in training. Participants completed a table (Table I) documenting involvement in various laparoscopic procedures, differentiating between their roles as either assistant or primary surgeon. Provision was made for procedures not included in the survey. Access to additional non-operative training was also assessed. Options included: none, animal models, box trainer, virtual reality simulators, and courses. More than one option could be chosen. Finally, registrars were asked if they were satisfied with their training.

Results

The results are summarised in Table I. Sixteen registrars responded, with at least 2 registrars from each of the following regions: Durban, Cape Town, Stellenbosch, Pretoria, Witwatersrand, and East London. Of the responding registrars, 10 were in their first or second year (junior), and 6 in their third to fifth year (senior) of training. There are currently 11 - 17 consultants involved in laparoscopic training, which is an average of nearly 3 consultants per institution, and a ratio of 0.6:1 consultants-per-registrar.

The most common procedures assisted were fundoplication, pyloromyotomy and exploration for impalpable testis. Those performed included diagnostic laparoscopy, laparoscopy for impalpable testis, and pyloromyotomy. Other procedures included were liver biopsy, cholangiogram, gonadal biopsy, thoracoscopy, rectopexy and nephrectomy.

Figs 1 and 2 show percentages of registrars surveyed (both junior and senior) who assisted in, and performed, the respective procedures. Fig. 3 shows that, besides gastrostomy, no other procedure was performed on a regular basis by any registrars. While tracheo-oesophageal fistula (TOF) repair and imperforate anus repair were performed laparoscopically by consultants, no registrars performed these procedures during the research period. Thoracoscopic lung biopsy was performed at only one institution by paediatric surgeons; this was most probably due to the procedure being the domain of thoracic surgeons at other institutions.

Regarding additional training in laparoscopy, no registrars received training on animals, 3 received no additional training,

TABLE I. INDEX LAPARASCOPIC PROCEDURES PERFORMED AND ASSISTED IN THE PRECEDING YEAR

	Total number of responders (*N*=16)					
	Number of responders and number of cases assisted			Number of responders and number of cases performed		
Procedure	**None**	**1 - 10**	**>10**	**None**	**1 - 10**	**>10**
Appendicectomy	8	7	1	10	4	2
Inguinal hernia repair	8	6	2	11	2	3
Laparoscopy for impalpable testis	2	11	3	6	7	3
Fundoplication	0	9	7	10	6	0
Lung biopsy	11	4	1	16	0	0
Cholecystectomy	7	6	3	10	5	1
Pyloromyotomy	4	3	9	8	8	0
Tracheo-oesophageal fistula (TOF)/ oesophageal atresia repair	15	1	0	16	0	0
Gastrostomy	6	7	3	11	1	4
Diagnostic laparoscopy	2	12	2	4	10	2
Laparoscopic anterograde colonic enema (ACE) procedure	14	2	0	15	1	0
Repair of anus imperforatum	5	11	0	16	0	0
Anal pull-through	4	12	0	15	1	0
Colectomy	**No cases assisted or performed**					

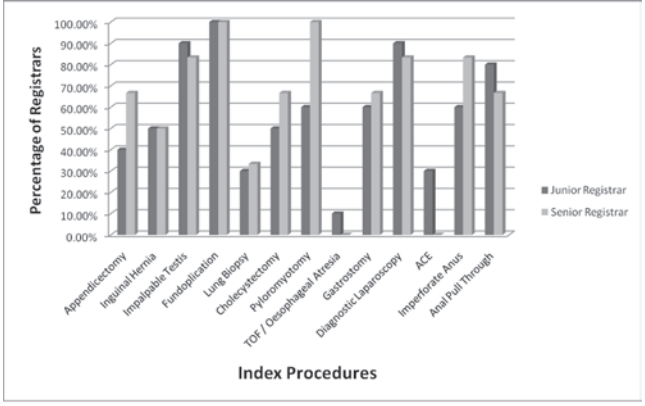

Fig. 1. Percentage of registrars who assisted in at least one case in the preceding year (index procedures with no assisted cases have been omitted).

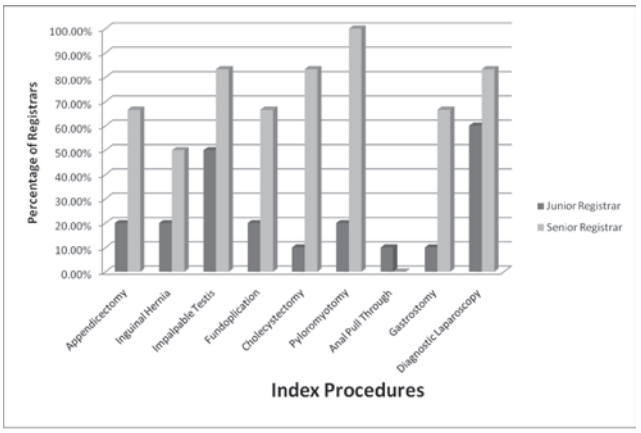

Fig. 2. Percentage of registrars who performed at least one case in the preceding year (index procedures with no cases performed have been omitted).

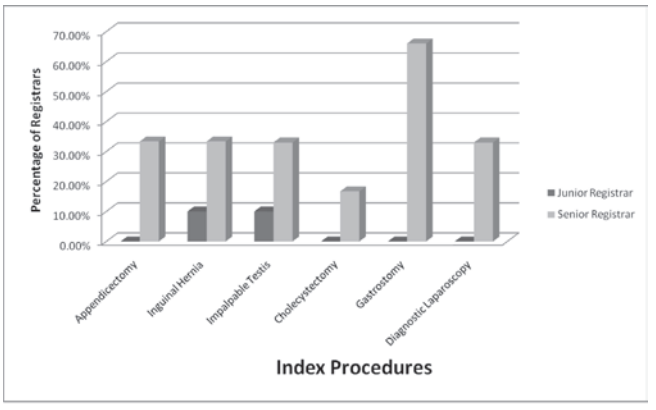

Fig. 3. Percentage of registrars who performed more than 10 cases in the preceding year (index procedures with less than 10 cases performed have been omitted).

3 used a box trainer, 3 attended training courses, 2 trained on a box trainer as well as attending courses, 1 had trained on both a box as well as on a virtual trainer, and 2 had received additional training with all 3 modalities (2 did not respond to the question).

Forty-four per cent of registrars were satisfied with their training in laparoscopic paediatric surgery. By breakdown of seniority, 66% of senior registrars were satisfied with their laparoscopic training, and 30% of junior registrars were satisfied.

Discussion

Paediatric laparoscopic surgery was pioneered by Dr Stephen Gans;[1] however, obstacles to its introduction and advancement have meant that it is still being developed and perfected. This influence is particularly apparent in the training of these techniques, as evidenced by the current lack of a structured

programme across South Africa. Issues that affect training include:

- availability of training cases
- consultant availability and expertise
- feasibility of after-hours laparoscopic surgery
- availability of additional training aids
- teaching of both open and laparoscopic techniques is required.

Paediatric surgery is 'a speciality of rarities'[2] – a problem in that the number of cases required to become proficient in a particular procedure may not be available. Dagash *et al*. suggest that a potential solution may be collaboration with laparoscopic surgeons with adult and paediatric backgrounds,[3] which may allow acquisition of skills in adults before progression to children, so expediting a faster learning curve. Therefore, in structuring training, a factor for 'number of cases performed = proficiency' may need to be set. Unfortunately, the literature does not always support this concept.[3] The ratio of consultants to registrars is favourable in South Africa, so this factor should not have an impact on training. Consultant experience may have an influence, however, as these surgeons may still be on a learning curve themselves and, as their proficiency improves, their skills will hopefully be passed on to registrars.

The feasibility of performing laparoscopic procedures after hours is often a hurdle. Consultants and trained theatre staff may not be available during these times. Limited availability of theatre time after hours and perceived time difference between open and laparoscopic procedures may have a negative impact, and equipment is not always available. Stormer and Sabharwal[4] found that 69% of trainees considered that time of day affected the likelihood of a procedure being performed laparoscopically. Furthermore, 'availability of equipment and training and enthusiasm of operating room staff' were hindrances. These issues may explain why appendicectomy, often performed after hours, is performed infrequently laparoscopically by our trainees. Regarding additional training, the role of minimal access simulators is addressed by Lasko *et al*., who found that 86.2% of respondent trainee paediatric surgeons and training directors in North America felt that minimal access surgery (MAS) simulators improve paediatric surgery training efficiency, and 79.3% felt that maximum effort should be made to increase exposure to MAS simulators.[5]

In our review of additional training, responses varied widely across institutions; some trainees received no training, others plenty. It is possible that training facilities are not available at every institution, or that facilities are available but not utilised; reasons may include clinical responsibilities, resources/funding, and desire to learn.[5,6] Resources for non-operative training should be improved at institutions where facilities are lacking, and structured obligatory training programmes are required to ensure use of available training equipment.

Registrar satisfaction (44%) is low. However, seniors were more satisfied than juniors. What was notable was that feelings were not uniform, suggesting that standardisation of training will improve not only skills but also satisfaction.

Our study focused on registrar training in laparoscopic surgery, with no comparison with 'open' surgical training. It is possible that junior registrars are still learning open surgical techniques and, as such, have not graduated to technically more advanced laparoscopic procedures. Similarly, the volume of cases available for teaching open procedures may preclude teaching laparoscopic techniques. Opportunity therefore exists for further research to compare open and laparoscopic training in the same cohort.

Conclusion

Laparoscopic training for paediatric surgical registrars in South Africa is currently in its infancy, with several barriers preventing adequate training. While registrars are privileged to have a favourable registrar-to-consultant ratio and a high case load, improvement in consultant skills, feasibility of after-hours procedures, and adequate non-operative training facilities are current obstacles to the acquisition of laparoscopic expertise. The introduction of a structured laparoscopic training programme across all institutions can only improve on current training and ensure satisfaction among registrars at all training institutions.

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