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To teach and to learn in day surgery. The role of residents

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ABSTRACT

Background: Our Division of Surgery is a University Department. Residents perform in Day Surgery theatre room with tutors of proven experience. This study looks to explore ways in which senior tutors in Day Surgery can contribute to teach. Infact the School of postgraduate Surgery obliges postgraduate surgeons to carry out a number of minor and medium size operations.

Methods: This study was carried out in 2006. In this year were performed n.116 Inguinal Hernia repairs with method by Trabucco. Residents performed N.51 Inguinal Hernia repairs as first surgeons, assisted by a tutor with proven experience.

Results: All patients were discharged home on the day of their operations. The post-operative morbidity rate was the same of that encountered during surgery performed by experienced surgeons. Two recurrences were reported: one patient operated by a resident and one patient operated by an experienced colleague.

Conclusions: In Day Surgery it is not possible to do a teaching programme. The opportunity to see patients' pre-operatively and follow them through surgery discharge on the same day is unique. The residents can contribute to quality of Day Surgery and learn. Day Surgery Units could play an increased role in medical education.

1. Introduction

The Schools of Specialization in Surgery oblige Residents to carry out as first surgeon operations of minor and medium difficulty.

The advent of Day Surgery represents an opportunity for medical education.[1] Our Department of General Surgery of University of Insubria operates in a multidisciplinary day surgery which includes general, vascular, breast and plastic Surgery and provides residents with the opportunity of gaining surgical experience.

Recent medical and surgical advances led to an explosion in the use of Day Surgery, making traditional teaching untenable and necessitating a transfer of undergraduate teaching programmes into day surgery setting.[2]

Graduate surgical education in the United States follows a model of graded clinical responsibility and operative experience, with continuous evaluation, throughout a residency programme. The programme requirements for residency surgery as defined by the Accreditation Council for graduate Medical Education state: "Operative skill is essential and can be acquired only through personal experience and training. The programme must provide for sufficient operative experience to train qualified surgeons, taking into account individual capability and rate of progress".[3,4]

2. Objective

This study was carried out to determinate how Senior Tutors can contribute to teach in Day Surgery setting, demonstrating that the Day Surgery setting is an opportunity for post-graduate Surgeons' training and those Residents can contribute to assure programmes' quality in Day Surgery.

Almost all studies show no negative effect on outcome when patients are operated on at hospitals with residents involved in patient care.[5,6] One variable that could influence the results seen in this study is the degree of attending surgeon supervision. Fallon et al. reported that, when surgical procedures were performed with low levels of attending surgeon supervision, complications and mortality were higher.[7]

3. Methods

This study includes all surgical procedures performed between January and December 2006 in Day Surgery. During this 1-year

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Table 1

Operations	N.
Inguinal hernia repair	119
Adipomas excisions	39
Pilonidal cyst excisions	24
Umbilical hernia repair	15
Miscellaneous	15
Anal fistula excision	5
Haemorrhoidectomy	4
Epigastric hernia repair	2
Crural hernia repair	2
Anal polyp excision	1
Total	231

Table 2
Post-operative complications.

Complication	Operation
1 Hypotension (0.4%)	Inguinal hernia repair
1 Severe pain (0.4%)	Inguinal hernia repair
0 Bleeding (0.00%)	
3 Bladder catheters (0.7%)	1 Haemorrhoidectomy 2 Inguinal hernia repair
Total 5 patients (2.1%)	

Table 3
Long-term complications.

Complication (one day–7 days after surgery)	Operation	Residents	Experienced surgeons
1 Bleeding (0.4%)	1 Pilonidal cyst	1	0
1 Hypotension (0.4%)	1 Adipoma abdominal	0	1
1 Deep pain (0.4%)	1 haemorrhoidectomy	1	0
1 Wound abscess (0.4%)	1 Pilonidal cyst	1	0
2 Fever (0.8%)	2 Inguinal hernia	1	1
3 Haematoma (1.2%)	3 Inguinal hernia	0	3
4 Seromas (1.7%)	1 Ombelic hernia 2 Inguinal hernia 1 Adipoma	1	3
6 Dehiscences (2.5%)	4 Pilonidal cyst 1 Adipoma 1 Hernia	2	4

period 590 surgical operations were performed, including general, breast, vascular and plastic surgery.

There were 20 surgical residents, 11 from general surgery, 6 from vascular surgery, and 3 from plastic surgery. The Vascular Surgery residents operated as first surgeons in 165 operations (27%); the Plastic Surgery residents had 35 operations (5.9%), and the General Surgery residents 216 operations (36%).

The post-graduate surgeons operated the 70.5% of patients in Day Surgery in 2006. This study only includes general surgery residents; vascular, plastic and breast surgery residents were not included.

4. Results

In 2006 we performed 231 operations of General Surgery that are detailed in Table 1. Day Surgery offers residents a great opportunity of dealing with these procedures. During their surgical education period, they can learn how to perform hernia repairs under the supervision of an attending surgeon who assists them during the whole operation. In literature it is underlined that hands-on instruction and graded clinical responsibility are integral components of surgical education in North America.[3]

Table 4
Post-operative morbidity in inguinal hernia repairs 7 (5.8%).

Post-operative morbidity	Residents	Experienced surgeons
3 Seromas	1 (1.9%)	2 (2.9%)
1 Fever	0	1 (1.4%)
3 Haematomas	1 (1.9%)	2 (2.9%)
0 Wound abscess	0	0
0 Bleeding	0	0
Total	2 (3.9%)	5 (7.3%)
Complications occurred in 7 cases (5.8%)		

Table 5
Post-operative morbidity in inguinal hernia repairs 7 (5.8%).

Prolonged Hospitalization	1 For anaesthesia complication: deep pain in lower extremity after spinal anaesthesia (radiculitis) (0.4%)
Telephone contact after hospital discharge	1 For fever (0.4%)
Re-admission	0 (0.0%)

In our group the most common procedure was inguinal hernia repair. All patients received inguinal hernia repairs using a pre-shaped mesh (polypropylene). The meshes were shaped according to the Trabucco model.

All patients received antibiotic prophylaxis according to a rotation protocol and tolerance of patients: single doses of Cefazoline (2 g.) or Ampicillin Sulbactam (3 g.) were given intravenously 15 min before surgery.

The group of 11 Resident in General Surgery operated on 51 inguinal hernia repairs (42%) together with an experienced tutor.

The Residents were as first year of specialization[2]; as second[4]; as fifth[1] and sixth.[4]

4.1. Complications in general surgery in day surgery

Most studies showed that major complications rarely occur after procedures performed in Day Surgery.[8,9]

Warner et al. studied the incidence of these complications in a large population of adult patients and found the incidence of major complications 1:1455 (0.07%).[8] As showed by Chung and Baylon the type of surgery plays a role in determining the post-operative minor early (within 24 h) morbidity.[9]

The most common anaesthetic complications following in Day Surgery are pain, nausea and vomiting, headache and delayed discharge, while the most common minor surgical complications are bleeding and unplanned extensive surgery.

4.2. Our experience in general surgery

The overall post-operative complication rate was 5.2% (12/231); the different type of complications recorded in relation with the procedure performed are detailed in Table 2. The longterm complications are delated in Table 3.

In 2006 we performed 119 inguinal hernia repairs (Tables 3–5).

51 patients were operated on by residents and 68 operated by experienced surgeons. In literature Lau and Lee showed that complications of day-case inguinal hernia repairs surgery is 5.2%.[10]

5. Conclusion

In our study 99.1% of patients operated on for inguinal hernia repairs were discharged on the day of operation according to the data reported in recent literature.[10]

In literature 97% of patient operated are discharged.

The interoperative surgical morbidity rate of residents was the same as that encountered during surgery performed by experienced surgeons. In particular during operations performed by residents no interoperative surgical morbidity was reported.

These patients are followed up through an ambulatory physical examination (median follow up: 5 months (range 3–7 months)).

An evaluation of follow up of inguinal hernia repairs, confirms that in 2006 there were 2 recurrences (1.6%). Follow up was calculated from the date of the operation. It ranged from 3 to 7 months. Out of 119 patients operated for inguinal hernia repairs, two had recurrence, one patient operated by a resident and one operated by an experienced surgeon.

These results were achieved by using selective criteria that considered not only the pathological condition but also the individual experience of residents, and the use of a planned programme. In fact patients with voluminous or recurrent inguinal hernias were excluded.

We had no intra-operative surgical complications and morbidity was 5.8% similar to that reported in Literature.

Our study confirms that residents have a recognized place in Day Surgery.

Our Department of General Surgery adequately prepares them for practical surgery health care.

Conflict of interest statement
None declared.

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References

1. O' Driscoll MC, Rudkin GE, Carty VM. Day surgery: teaching the next generation. *Med Educ* 1998 Jul;**32**(4):390–5.
2. Rudkin GE, O' Driscoll MC, Carthy VM. Does a teaching programme in Day Surgery impact on efficiency and quality of care? *Aust N Z J Surg* 1997 Dec;**67**(12):883–7.
3. Mark Wilkiemeyer K, Pappas Theodore N, Giobbie-Hurder Anita, Itani Kamal MF, Jonasson Olga, Neumajer Leigh A. Does resident post-graduate year influence the outcomes of inguinal hernia repair? *Ann Surg* 2005 June;**241**(6):879–84.
4. American Medical Association. Graduate medical education directory. Chicago: American California. *Surgery* 2000;**128**:286–92.
5. Hutter MM, Glasgow RE, Mulvill SJ. Does the participation of a surgical trainee adversely impact patient outcomes? A study of pancreatic resection in California. *Surgery* 2000;**128**:286–92.
6. Praseedom RK, Paislet A, Madhavan KKK, Garden OJ, Carter DC, Paterson-Brown S, et al. Supervised surgical trainees can perform pancreatic resections safely. *JR Coll Surg Edimb* 1999;**44**:16–8.
7. Fallon Jr WF, Wears RL, Tepas III JJ. Resident supervision in the operating room :does this impact on outcome? *J Trauma* 1993;**35**:556–60.
8. Warner MA, Schield SE, Chute CG. Major morbidity and mortality within one month of ambulatory surgery and anaesthesia. *JAMA* 1993;**270**:1437–41.
9. Chung F, Baylon GJ. Persistent symptoms delayed discharge after day surgery. *Can J Anaesth* 1994;**40**:A21.
10. Lau H, Lee F. An AUDIT of the early outcomes of ambulatory inguinal hernia repair at a surgical day-care centre. *Hong Kong Med J* June 2000;**6**(2):218–9.