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Outpatient repair for inguinal hernia in elderly patients: Still a challenge?



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ABSTRACT

Background: Elective inguinal hernia repair as a day case is a safe and suitable procedure, with well-recognized feasibility. The increasing number of elderly patients requiring inguinal hernia repair leads clinicians to admit a growing number of outpatients. The aim of the current study was to analyze the outcomes (feasibility and safety) of day case treatment in elderly patients. **Methods:** Eighty patients >80 years of age and 80 patients ≤55 years of age underwent elective inguinal hernia repairs under local anesthesia. **Results:** There were no mortalities or major complications in the elderly undergoing inguinal herniorrhaphies as outpatients, and only one unanticipated admission occurred in the younger age group. **Conclusions:** Elective inguinal hernia repair in the elderly has a good outcome, and age alone should not be a drawback to day case treatment.

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1. Introduction

Inguinal hernia repair is one of the most common surgical treatments performed worldwide. The standardization and reproducibility of the inguinal herniorrhaphy technique, the low surgical impact, the short post-operative course, and the suitability of local anesthesia, have justified the outpatient management of inguinal hernias. Simplification of the admission procedure and a shorter stay in the hospital leads to less interference in the everyday life of patients and a faster return to the comfort of their own homes, as well as a reduction in the risk of severe post-operative complications, such as cross-infection and venous thromboembolism. Furthermore, outpatient surgery has been shown to lower the costs of hospitalization [1,2].

Over the last decade, Day Surgery has been significantly expanded in several countries, and today many efforts are underway to increase the range of application for day surgery. The main drawback to Day Surgery is the selection of eligible patients in

order to preserve the same effectiveness and safety as inpatient hospitalization.

The overall increase in life expectancy has also led to a greater number of elderly surgical patients, especially in developed countries. In fact, the incidence of inguinal hernias is higher in the elderly, as a consequence of a progressive muscular-aponeurotic weakness and increased basal intra-abdominal pressure. Thus, more patients require surgical treatment.

Age and severe co-morbidities can be relative contraindication for patients with asymptomatic inguinal hernias at low risk for complications, or at least from surgery on an outpatient basis. Therefore, many surgeons advise a watchful waiting policy in patients with asymptomatic hernias because incarceration of acute hernias is rare [3–5]. Nevertheless, emergency surgery in the elderly has a high mortality rate, and an incidence of severe complications ranging between 3% and 88% [6–8]. The decision to admit an elderly patient to a day surgery unit must always be based on a careful assessment of concomitant illnesses and the operative risk.

The aim of the current study was to analyze the outcomes (feasibility and safety) of day case treatment in elderly patients (≥80 years of age) undergoing inguinal hernia repair on an outpatient basis during a 3-year interval compared with a younger group (≤55 years of age). The study was approved by the Scientific Committee of the "R. Paolucci" Department of Surgery at the University of Rome "Sapienza."

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2. Materials and methods

Between January 2007 and December 2011, 527 patients were admitted to the Day Surgery Unit of The Department of Surgery at “R. Paolucci” of the University of Rome “Sapienza” to undergo a primary inguinal hernia repair. The study analyzed the collected data of 80 consecutive patients ≥ 80 years of age (mean age, 82.4 years) retrospectively compared with the same number of patients ≤ 55 years of age (mean age, 42.6 years) treated during the same time period.

The exclusion criteria included a body mass index (BMI) > 30 kg/m², American Society of Anesthesiologists (ASA) score ≥ 4 (Table 1), incarcerated hernia, history of drug/alcohol abuse, psychiatric disorders, and unacceptable home support, according to international guidelines [9,10]. Patients with cardiovascular co-morbidities were also assessed using the Goldman criteria [11]; cardiac high-risk cases were excluded (Goldman criteria III). The following parameters were recorded: age; gender; main co-morbidities; ASA score; type of hernia; post-anesthetic discharge scoring system (PADSS; Table 2), post-operative pain (at discharge and after 24 h); complications; and mortality.

Thromboembolism prophylaxis with low molecular weight heparin is not routinely offered. Antibiotic ultra-short prophylaxis with amoxicillin was administered before local anesthesia. All patients were submitted to open hernia repair based on the Lichtenstein technique under local anesthesia, supported with midazolam and remifentanyl.

After reduction of the hernia sac, a pre-shaped polypropylene mesh was placed on the transversalis fascia and fixed with fibrin glue. In the presence of a medial hernia, the fascial defect in the posterior wall of the inguinal canal was reinforced with a polyglactin suture.

PADSS was always filled in and used as an indicator for safe discharge [9,12]. Post-operative pain and other complications were assessed by a surgeon and anesthesiologist before discharge. Analgesic drugs were routinely prescribed (acetaminophen [325 mg] + tramadol [37.5 mg], 1 tablet every 8 h for 2 days after discharge).

Patients were contacted by telephone 24 h after discharge to monitor the post-operative course to detect any problems or complaints and to register any possible complications. The patients returned to the hospital for check-ups and medications until they had recovered fully.

Patients were asked about local conditions and general symptoms, such as pain, fever, psychomotor agitation, bleeding, nausea, and vomiting. Pain was expressed according to the Numeric Rating Scale (NRS), ranging between 0 (no pain) and 10 (the maximum conceivable pain). The patients were contacted 1 month post-operatively for further follow-up.

As main outcomes, mortality, major post-operative complications, and unanticipated admissions were considered. Secondary outcomes included pain, nausea and vomiting, wound complications, urinary retention, and light bleeding.

Statistical analysis was performed using software SPSS for Windows (version 13.0). Pearson χ^2 (or Fisher exact test) and Student's *t*-test were used to test for significance in categorical and

Table 1
American Society of Anesthesiologists (ASA) score.

ASA 1	A normal healthy patient.
ASA 2	A patient with mild systemic disease.
ASA 3	A patient with severe systemic disease.
ASA 4	A patient with severe systemic disease that is a constant threat to life.
ASA 5	A moribund patient who is not expected to survive

Table 2
Post anesthesia discharge score system (P.A.D.S.S).

Vital signs	0 = $> 40\%$ of preoperative value 1 = 20–40% of preoperative value 2 = $< 20\%$ of preoperative value
Ambulation	0 = difficult/impossible 1 = toddle 2 = steady
Postoperative nausea/vomiting (PONV)	0 = severe 1 = moderate 2 = minimal
Pain	0 = severe 1 = moderate 2 = minimal
Surgical bleeding	0 = severe 1 = moderate 2 = minimal/absent
Voiding	0 = retention 1 = difficult 2 = normal
Total	= .../12

quantitative variables, respectively. Differences among groups were considered statistically significant for a *p*-value < 0.05 .

3. Results

All procedures in both groups were carried out under local anesthesia without any conversion to general anesthesia. All patients were discharged 4–6 h after surgery, with the exception of one unanticipated hospital admission among the younger group for severe pain.

The demographics of both groups are shown in Table 3. As expected, the patients in the ≥ 80 year age group showed a statistically higher ASA score and a higher prevalence of concomitant diseases, compared to the ≤ 55 year age group. The majority of elderly patients had multiple co-morbidities.

The incidence of different hernia types detected intra-operatively is shown in Table 3. In both groups, lateral hernias were observed more frequently than medial hernias.

Elderly patients had a mean post-operative NRS score of 2.75 ± 1.65 (median score = 3), which was similar to the mean post-

Table 3
Demography and risk factors.

	Aged ≥ 80 ys (n = 80)	Aged ≤ 55 ys (n = 80)	<i>p</i> value
Age (years)	82.4 ± 4.1 (80 –87)	42.6 ± 8.7 (20 –55)	
Male/female ratio	74/6	73/7	NS
ASA ^a 1/2/3	18/54/8	70/10/0	0.001
Comorbidities:			
Cerebrovascular disease (n)	6	–	0.009
Cardiac affections or arterial hypertension (n)	61	10	0.001
Respiratory diseases (n)	10	3	0.051
Metabolic disorders (n)	23	4	0.001
Hernia type:			
Medial (n)	31	29	
Lateral (n)	39	43	
Recurrent (n)	5	2	
Medial + Lateral (n)	5	6	NS

^a ASA: American Society of Anesthesiologists.

operative NRS score reported for younger patients (2.92 ± 1.53 ; median score = 3), without a significant difference between the two groups ($p = 0.374$). With respect to the perception of pain, the same outcome was observed 24 h after surgery (Table 4). In contrast, a statistically significant difference was detected regarding the post-operative use of analgesics at home during the first 24 h post-operatively. There was a need for analgesics in 75% of patients ≤ 55 years of age compared to 53.7% of patients ≥ 80 years of age ($p = 0.004$).

No deaths and no major complications within 30 days of surgery occurred in the present series. The post-operative complications are reported in Table 5. Wound infections, local seromas/hematomas, scrotal edema, and general symptoms (fever and nausea/vomiting) were recorded and analyzed. No statistical difference existed between the two groups. The recurrence rate was not considered in the current study because of the short time of observation; however no apparent recurrences were detected.

4. Discussion

Current policies in healthcare encourage an increase in ambulatory and same-day surgery and expanding the indications for outpatient surgery as it is more cost-effective and better accepted by most patients [1,13]. Indeed, a short hospital stay is considered psychologically less stressful and reduces separation from the familiar home environment.

Currently, elective inguinal hernia repair under local anesthesia is generally a well-codified and widely-performed surgery, as advanced age and co-morbidities cannot be considered absolute contraindications to the feasibility of the procedure. In fact, outpatient herniorrhaphy is the current standard in many surgical units [14,15].

In our Day Surgery Unit, hernia repair is performed according to the Lichtenstein technique with mesh fixation by fibrin glue. This technique is safe and reduces the long-term incidence of pain and numbness.

Elderly patients are often advised not to undergo elective groin hernia repair because of the higher risks of general anesthesia. In fact, the European Hernia Society guidelines state that an increase in morbidity and mortality could be associated with a generalized indication to operate on every inguinal hernia in elderly patients [5]; however, an increased risk has actually been confirmed in the literature for nonagenarians, but not for octogenarians [21]. Based on our experience, these concerns are not justified and elderly patients, when appropriately treated, have good outcomes that are similar to the outcomes for younger patients [1,6,21].

The most frequent co-morbidities which existed in our group of elderly patients included cardiac diseases, hypertension, and metabolic disorders. Appropriate and careful selection of patients is mandatory to exclude patients who need a prolonged post-operative surveillance.

Table 4
Postoperative pain.

	Aged ≥ 80 ys (n = 80)	Aged ≤ 55 ys (n = 80)	p value
Mean NRS ^a at 3rd hour (range)	2.75 ± 1.65 (1–6)	2.92 ± 1.53 (1–6)	NS
Median NRS at 3rd hour	3	3	NS
Mean NRS at 24th hour (range)	2.42 ± 1.18 (1–4)	2.80 ± 1.22 (1–6)	NS
Median NRS at 24th hour	3	3	NS
Analgesic assumption at home (n)	43 (53.7%)	60 (75.0%)	0.004

^a Numeric Rating scale.

Table 5
Postoperative outcome.

	Aged ≥ 80 ys (n = 80)	Aged ≤ 55 ys (n = 80)	p value
Operative time (min)	61.9 ± 18.6 (45–100)	59.2 ± 19.1 (40–105)	NS
PADSS: 10/11/12	1/26/53	1/29/50	NS
Postoperative complications:			
Seroma/haematoma	3	3	NS
Urinary retention	0	1	NS
Wound infection	0	3	NS
Chronic inguinal discomfort	0	1	NS
Scrotal swelling	6	2	NS
General complications (nausea, vomiting, fever)	2	6	NS
Unanticipated admission	0	1	NS
Mortality (within 30 days)	0	0	NS

Patients at high operative risk, such as ASA 4 patients, should not be considered for outpatient surgery in our opinion, although Sanjai et al. reported that ASA grades 3 and 4 patients do not need to be excluded from outpatient surgery [10]. Accordingly, Goldman III patients are also not suitable for outpatient surgery [20].

Experienced surgeons can perform surgery with minimal trauma, thus avoiding the onset of post-operative complications, such as chronic neuralgia [16]. Improved local anesthetic techniques and new medications with rare side effects, such as midazolam and remifentanyl, help to ensure a rapid post-operative recovery.

Furthermore, local anesthesia is technically simple to perform and devoid of risks, and seems to be particularly indicated for elderly patients, who often are poor candidates for general anesthesia. The local anesthesia technique has many advantages over general anesthesia, such as early ambulation, prevention of cardiopulmonary deficiencies, avoidance of paralytic ileus, and urinary retention. Although a higher incidence of larger hernias in elderly patients has been reported, local anesthesia remains the best choice for inguinal hernia repair in outpatient surgery [17,18].

In the present study, elderly patients had worse general health status and higher ASA scores than the younger patients, but surgical morbidity was not significantly different between the two groups, as reported in the literature [21]. The early post-operative course, the incidence of local and systemic complications, and the recurrence rates were not statistically different. The perceived pain, as measured by NRS, was even higher in the younger age group, with more frequent use of analgesic drugs at home. The prevalence of unplanned admissions in our series was 1/160, and due to severe post-operative pain in a patient in the younger group. We did not detect major complications in the elderly group, and we can conclude that outpatient repair of inguinal hernias does not usually cause a worsening of the patient's clinical status. In this sense, the results of the present study are comparable to the results reported by other patients, and focused on the treatment of elderly patients on an outpatient basis [1,10,19]. Proper selection of both elderly and younger patients is clearly recommended. If this criterion is met, both groups exhibit statistically insignificant differences concerning the incidence of post-operative complications, with elderly patients having a lower perception of post-operative pain, thus requiring a reduced amount of analgesics.

Ethical approval

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Author contribution

Piergaspare Palumbo: Participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data; also participated substantially in the drafting and editing of the manuscript.

Chiara Amatucci: Participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data.

Bruno Perotti: Participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data.

Antonio Zullino: Participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data.

Claudia Dezzi: Participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data.

Giulio Illuminati: Participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data.

Francesco Vietri: Participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data; also participated substantially in the drafting and editing of the manuscript.

Conflicts of interest

All authors have no conflict of interests.

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