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## Original research

### Perioperative care in elderly patients undergoing thyroid surgery



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#### ABSTRACT

The features of western world population are rapidly changing. The increment geriatric population obliges clinicians to implement specific recommendations and guidelines to manage these patients.

In the field of thyroid surgery, when indications are represented by benign conditions, surgeons and endocrinologists tend to avoid surgery for the increased perioperative risks in the over 70 year old population.

We reviewed our experience in thyroid surgery in geriatric patients within the environment of a "week surgery unit". This unit was conceived to offer a highly specialized setting for thyroid patients needing short stay after surgery.

Results showed that the surgical outcomes were comparable to the ones from third surgery in young patients.

The week surgery approach is the best and safest formula to offer to the geriatric population needing thyroid surgery.

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## 1. Introduction

The definition of geriatric population may strongly vary in medical literature. Different authors used 65, 70 or 75 years as cut off [1]. Western world population is rapidly changing. According to the USA Census Bureau, the increased life expectancy will lead to an approximately 80 millions of elderly population by 2050.

The prevalence of thyroid nodules increases with age; almost 50% of patients  $\geq 65$  years demonstrate nodules on ultrasound examination [2].

It has been estimated that 90% of thyroid glands in women over the age of 70 will contain nodules and 80% of the glands of men over the age of 80 will be nodular [3].

The incidence of thyroid cancer also increases with age [4,5]. Elderly patients often present with more aggressive forms of

thyroid cancer, larger tumours, more extensive local growth, or distant metastases [6–8].

The increasing number of the geriatric population obliges clinicians to establish guidelines and protocols to standardize the optimal care for these patients.

Several studies have confirmed that, in general, elderly is not a contraindication to elective thyroid surgery. Nevertheless the prevailing approach among surgeons has long been to avoid elective surgery on the elderly, as they tend to have higher rates of comorbidity, longer postoperative stays, and poorer long-term outcomes [9].

Because of an elevated risk for perioperative morbidity among elderly patients undergoing surgical procedures, indications for thyroidectomy in this population are often restricted to overt compressive symptoms or a strong suspicion for malignancy [10].

In the era of the "fast track" applied to surgical patients, paramount importance is given to the optimization of the perioperative care in order to avoid unnecessary money and time waste aiming to obtain the best cost-effectiveness formula.

In this scenario where different combinations of short stay hospitalization have been attempted in thyroid surgery [11–13], hereby we report our experience of "week surgery" approach to thyroid surgery applied also to the geriatric population.

Abbreviations: USA, United States of America; IV, intravenous; NSAID, non-steroidal anti-inflammatory drugs; ASA, American society of anaesthesiologists; FNA, fine needle aspiration; ICU, intensive care unit; TDS, Ter Die Sumendum.

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## 2. Methods

In our Department of Surgical Science approximately 80 thyroid procedures per year are performed.

Since January 2011 a short stay “week surgery” Unit was established to accommodate patients undergoing thyroid and parathyroid procedures. This unit was conceived to offer a service of excellence to thyroid patients within a highly specialized medical environment and in order to reduce costs of unnecessary hospitalizations in regular inpatients wards.

### 2.1. Week surgery pathway

#### 2.1.1. Preoperative assessment

Patients seen in the Outpatient Clinic with an established indication for surgery were given an appointment for the pre-assessment clinic within 15 days. The patient attending the pre-assessment unit was seen by one of the junior member of the Surgical Team and by a senior Anaesthetist after having performed blood test (full blood count, biochemistry, thyroid function test), chest X-ray, Pulmonary function test. Those tests were aimed to reveal any relevant condition that might have raised the surgical or anaesthetic risk. Vocal cords were routinely assessed by indirect laryngoscopy to detect pre-existing dysfunctions. Some of the patients were sent to have pre-operative Q-Elastosonography of the thyroid nodules as predictor of malignancy [14].

#### 2.1.2. Surgery

Patients were admitted on the same day of the surgery having been starved from the night before to solid food and to clear fluid till two hours before surgery. This would have typically happened at the beginning of the week (either on a Monday or a Tuesday). Total or subtotal thyroidectomies were performed in a standard fashion without the use of energy devices under general anaesthetic [15]. Extreme importance was given to the recognition and preservation of parathyroid glands, of the external branch of the superior laryngeal nerves and of the recurrent nerves. One suction drains were left bilaterally in the thyroid lodge. Closure of the cervicotomy was typically performed with subcuticular absorbable suture [16]. Thyroid specimen with cancer was sent for biomolecular study in order to detect BRAF mutations as predictor for possible target therapy [17].

#### 2.1.3. Post-operative care

Patients undergoing surgery in the morning were normally let eating and drinking on the same day few hours after the end of the surgical procedure. As required analgesia was prescribed using either IV paracetamol or NSAID tablets. Calcium supplements and Vitamin D3 were not routinely prescribed. In case of acute hypocalcaemic crisis, IV Calcium gluconate was administered intravenously. Calcium level in the blood was tested everyday starting from the morning after surgery. The suction drain was removed on day 2 post op.

#### 2.1.4. Discharge criteria

Patients were deemed dischargeable, typically on day 2 or day 3 after surgery:

- in absence of complications (hypocalcaemic crisis, haematoma, cardio-respiratory complications)
- with a level of blood calcium >7 mg/dl
- pain controlled with oral medication
- patients compliant to be discharged

Those patients that did not fulfil the discharge criteria by the Friday of the same week, were transferred to the normal surgical elective ward as the “week surgery” unit would have closed by the Friday evening. Follow up and post surgical care were arranged alongside with the endocrinologist colleagues to detect the best medical formula [18].

## 3. Our experience

Since the implementation of the week Surgery in February 2011, 167 patients were admitted and underwent thyroid surgery. Of those 15 were above 70 year old. Of the over-70 year old 4 were male and 11 were female. The indications for surgery within the geriatric population were: cancer, papillary proliferation, compressive symptoms, uncontrolled hyperthyroidism (relapses/non responders) (Table 1).

We examined the outcomes of the geriatric population undergoing “week thyroid surgery”.

The group of over 70 year old patients was quite heterogeneous in terms of co-morbidity. Their operative risk was stratified using the American Association of Anaesthetists score (ASA) (Table 2).

The outcomes considered were:

- intraoperative complication rate (difficult intubation, intra-operative cardiac events, need for postoperative intensive care)
- short term postoperative complication rate (hypocalcaemia, cardiorespiratory complications, infections, haematoma, early recurrent nerve palsy)
- long term postoperative complication rate (permanent hypocalcaemia, permanent recurrent nerve palsy)
- need for reoperation
- need to stay beyond the day 3 after surgery
- 30 day readmission rate
- 30 day mortality rate

## 4. Results

All of the patients underwent total thyroidectomy. Of the three cancer cases, all of them had the lymph-node dissection of the central compartment, and only one had associated also a radical neck dissection for malignant lymph-nodes on the preoperative cytology. The majority of geriatric patients were in the group of ASA 2 for the presence of comorbidity such as diabetes, hypertension and dyslipidaemia.

Four patients were scored ASA 3 for symptoms due to previous ischaemic cardiac and cerebral events. Only one patient was scored ASA 4 for the co-existence of ischaemic cardiac disease and chronic pulmonary condition. This 73 year old patient, that was affected by a single thyroid nodule resulting thy 5 on the FNA, was declared high risk for surgery. After discussion, decision was taken to carry on the procedure with a possible need for postoperative ICU bed, but this was not necessary and the patient had an uneventful recovery on the regular week surgery unit.

Examining the outcomes of the geriatric population undergoing thyroid surgery in our institution (Table 3) no long term

**Table 1**  
Showing the indications for thyroidectomy in the geriatric patients.

Indication	Number	%
Thy 3	5	33%
Compressive symptoms	4	26%
Uncontrolled hyperthyroidism	3	20%
Cancer	3	20%

**Table 2**  
Showing the ASA score among in the geriatric patients.

ASA	Number	%
1	0	0%
2	10	66%
3	4	26%
4	1	6%
5	0	0%

**Table 3**  
Summarizing the outcomes of interest within the geriatric patients operated.

Outcome	Number	%
Intraoperative complication	1	0%
Short term complications	4	26%
Long term complications	0	0%
Need for re-operation	0	0%
Transfer to regular ward	0	0%
30 day readmission rate	0	0%
30 day mortality	0	0%

complications at the 6 months follow up were revealed. No need for immediate reoperation, no readmission or fatal events within 30 days after surgery. None of the geriatric patients had to be transferred to the regular ward but all of them were discharged back home directly from the “week surgery Unit” on day 3 post op. We revealed 1 anaesthetic complication with a severe bronchospasm in one of the ASA 3 patient that was resolved and surgery continued uneventfully. The postoperative levels of blood calcium were within the normal range in all of the patients except four in which we revealed calcium level of <7.5 mg/dl. In those patients oral Calcium supplement and Vit D3 were administered and also continued for 5 days after surgery. None of these patients presented with permanent hypocalcaemia at the 1 week post op follow up.

## 5. Discussion

Passler et al. in their study compared the surgical outcomes of thyroid surgery procedures on patients aged <75 and >75 revealing no differences in terms of mortality and morbidity [1]. Also Rios et al. in their comparative study did not show any significant differences in perioperative outcomes in the two clusters of patients (<and >65) examined, underlining the importance of the close monitoring of the co-morbidities and of the pre-operative assessment [10]. Miccoli et al. in their case series of geriatric patients undergoing thyroid surgery revealed surgical and oncological outcomes entirely in line with the data on young patients [6]. In our experience the preassessment check-up revealed only 1 patient with an ASA score 4 with a highly increased surgical risk. After discussing this with the patient, patient’s family and anaesthetist team balancing the pros and the cons of an operation, the procedure was carried on anyway.

Despite almost 30 years have passed since the first day case thyroidectomy was described [19], this type of approach still accounts to a very small percentage of cases [20–22]. “Day Case thyroid surgery” has been proved feasible and safe on selected patients by several authors in case series [23,24]. Supporters of the day case surgery approach advocate that the majority (75%) of postoperative complications occur within 6 h from operation, and the remainder are seen between 7 h and 24 h [25]. But considering the risk of life-threatening bleeding alone, this occurs in the 37% [26,27] of cases between 7 and 24 h after operation and in the 10–19% [26,27] of cases after 24 h. We believe that the risk of developing neck haematomas once the patient has left the hospital

environment is a price too high to pay; for this reason we strongly believe that a short-stay hospitalization of 2–3 days is the most careful and safe approach to offer. In the case of the geriatric population the risk of fatal complication is even higher; those patients are more frequently on anticoagulant or antiplatelet medications, and their comorbidity status make the management of complications more difficult. Therefore in the geriatric patient we suggest even more strongly, that a 2–3 days hospitalization is recommended.

The routine use of prophylactic calcium is still controversial [25]. Data shows that up to a third of patients undergoing a total thyroidectomy [28] may become hypocalcaemic and require calcium and/or vitamin D analogue supplements. In our practice, calcium level <7 mg/dl was considered the cut-off for starting calcium and Vit D3 supplement. None of the cases showed a symptomatic hypocalcaemia or had a frank hypocalcaemic crisis requiring immediate IV Calcium. Given the low rate of postoperative hypocalcaemia and the potential risk of indiscriminate administration of Calcium and Vit D3 [29], we believe that the prophylactic administration of those should be limited to those patient with higher predictable chance to develop hypocalcaemia (e.g. preoperative hyperthyroidism).

All of the patients operated were started on liothyronine drops (14 mcg TDS) on the day after surgery. We preferred this drug to the standard levothyroxine to reduce the withdrawal timing if therapy with radioactive iodine was needed.

## 6. Conclusions

Our experience confirms that thyroidectomy in the geriatric population can be performed safely, with no increased risk of complications. The surgical procedure itself has to follow the standard rules of extreme safety and meticulousness paid on thyroidectomy performed on young patients. It’s of vital importance the preoperative assessment for the detection of co-morbidity that might result in the exclusion from operability due to high operative risk. A “week surgery” regime seems the best offer for geriatric patients undergoing thyroidectomy.

## Ethical approval

This is a retrospective study based only on the analyses of recorded data and then no Ethical Approval was necessary.

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## Author contribution

**Salvatore Guarino:** 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.

**Carla Di Cosimo:** Participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data.

**Carlo Chiesa:** 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.

**Alessio Metere:** 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.

**Valerio di Bella:** Participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data.

**Angelo Filippini:** 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.

**Laura Giacomelli:** 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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