Short-stay Hospitalisation for Malignant Thyroid Surgery in a District General Hospital: Retrospective Analysis and Consecutive Series of 3882 Cases over a Five-Year Period

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Abstract

Objectives: To describe data from patients undergoing thyroid surgeries for malignant disease in a District General Hospital in Shanghai.

Methods: Discharge data were collected from January 2010 to December 2014 with a searching strategy based on diagnosis of malignant thyroid disease and patients undergoing thyroid surgery .

Results: During the study period, 3882 cases of thyroid cancer were performed with thyroidectomy, 10.25% of patients (398 cases) stayed less than 24 hours, 32.99% of patients (1281 cases) stayed less than48 hours, 56.75% stayed (2203 cases) more than 48 hours. Various factors that contribute to length of stay (LOS) of surgery were analysed, medical economic parameters (drug cost, medical disposable materials cost, and total cost) were also studied.

Conclusion: This is the largest series reporting of short-stay hospitalisation outcomes of malignant thyroid surgery from China. The duration of hospitalization of the malignant thyroid surgery should be determined in accordance with chronic general and/ or comorbid conditions, Tumor size and sides, surgery procedure, and complication. Short-stay hospitalization model for malignant thyroid surgery is safe, cost-effective, and highly agreeable for patients in China.

Keywords: Length of stay; Thyroidectomy; Neck dissection; Total Cost.

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Introduction

Day-case and Short-stay surgery treatment has well-documented advantages related to both the patient and hospital [1]. Short-stay thyroid surgery (SSHS, <24 h hospital stay) is becoming increasingly popular throughout the world to reduced hospital stay and cost efficiency [2,3].

To decrease expenditure without compromising the quality of patient care, during the last 10 years, short-stay benign thyroid surgery has been performed in our District General Hospital, Renji Hospital, School of Medicine, Shanghai Jiaotong University as safe and cost-effective.

In China, hospitalizing patients undergoing malignant thyroid surgery were traditionally observed for 48 h or longer, to safeguard against potentially catastrophic complications such as postoperative hemorrhage (with resultant airway compression), hypocalcaemia and recurrent laryngeal nerve injury. The introduction of a prospective payment system (T2A) has led Surgeons in Shanghai to participate in the financial management and to reduce overall costs in their day-to-day medical practice. We are also trying to reduce the length of stay (LOS) malignant thyroid surgery since 2010, which wasn't accepted by most surgeons in China.

With experienced hands, strict selection criteria, and follow-up, we confirmed that short-stay hospitalisation model for malignant thyroid surgery is safe, cost-effective, and highly agreeable in patients.

During the study period from January 2010 to December 2014 in Renji Hospital, School of Medicine, Shanghai Jiaotong University, the authors retrospectively reviewed the data of 3882 thyroid cancer patient thyroidectomies which stayed <24 hours, 24 hours≤ n<48 hours , ≥48 hours; To determine the feasibility, safety, and medical economic parameters (drug cost, and medical disposable materials cost, total cost).

Patients and Methods

From January 2010 to December 2014 in Renji Hospital, School of Medicine, Shanghai Jiaotong University, 3882 consecutive thyroid cancer patients who underwent thyroidectomy were reviewed retrospectively. Preoperative workup included physical examination, ECG ,thorax radiography and blood tests required for general anesthesia and associated pathologies (Decompensated heart failure, respiratory failure, anticoagulation or antiaggregant therapy, epilepsy, diabetes mellitus, nephropathy, hepatopathy) should be control to endure the operation and general anesthesia. All patients received preoperative evaluation of vocal cord mobility by means of indirect laryngoscopy or fibrolaryngoscopy, thyroid function tests (fT3, fT4, TSH), preoperative ultrasonography and neck CT scan. FNA of suspicious or dominant thyroid nodules were performed in selected patients. All patients signed informed consent before surgery. The pre-, intra-, and postoperative details were preserved in a dedicated

database and retrospective analysis of medical notes was undertaken for these 3882 patients over a 5-year period.

All patients and relatives received extensive written and verbal preoperative and postoperative teaching and clear information and explanations in the hospital, delivered by the multidisciplinary team of nurses, surgeons, and anesthesiologists. This included psychological support and explicit information about postoperative health consequences such as risks and benefits of the shortening of hospital stay, wound management, postoperative pain, and signs and symptoms associated with complications.

A multidisciplinary team consisting of a surgeon, anesthesiologist and endocrinologist and nurse determined whether the patient's stay in hospital could be reduced. A complete preoperative assessment was obtained from all patients in order to determine the eligibility of the reduction of LOS. Patient with severe anxiety, sleep apnea syndrome, deafness, defective vision, metal retardation, pregnancy, preoperative unilateral recurrent nerve palsy, chronic pain, morbid obesity, taking drugs that have an effect on coagulation (aspirin, warfarin and corticosteroids) can't be allowed to be discharged less than 48 hours.

According to the tumor size, sides, pathologic type, lymph node metastasis and stage, surgeon determine which the following procedure to perform: total, near total thyroidectomy, hemithyroidectomy+ isthmusectomy, level VI (Central neck LN) dissection, lateral neck dissection(level II-V).

Hemostasis was achieved by ultrasonic scissors (Harmonic, Johnson & Johnson, Cincinnati, Ohio, USA) Meticulous hemostasis was performed before skin closure. Suction drains were left selectively in the operative field and removed the next day. If the amount of bleeding during the operation is less than 20ml, no drains are placed.

Immediate postoperative surveillance is essential. Clinical signs of postoperative cervical hematoma (increase in neck volume or upper airway dyspnea), recurrent nerve palsy (voice alteration, dyspnea, difficulty swallowing liquids), or hypocalcemia (circumoral or extremity paraesthesiae, carpo-pedal spasm or tetany) must be observed carefully. Laryngeal examination and measurement of serum calcium or PTH levels can be proposed. Ideally, PTH should be measured 4h after the end of surgery in order to best predict the risk of postoperative hypocalcaemia, an argument used against early discharge.

During their scheduled rounds, nurses monitored vital parameters (breathing, blood pressure, pulse rate), drainage volume, wound status, phonation, and pain (evaluated by means of Visual Analogue scale).

The patients were able to contact the unit by direct phone number (24 hr/day). Discharged patients were asked to keep the team informed about any wound discomfort occurring at home. Patients were asked to report any complication in the neck, such as swallowing distress, fever, sore throat, or wound infection. Ambulatory center is responsible for the coordination of subsequent use of resources such as contacts with physicians, unplanned emergency department visits, or hospital readmissions.

Discharge may be also delayed because of the Patient's non-medical contra-indications: difficulties in communication (non-native speaking patients), a long and difficult journey between home and the surgical facility (long distance, urban traffic), absence of emergency transportation or familial or social isolation.

In order to shorten the hospital stay of the malignant thyroid surgery. patients must have no major comorbidities, sufficient preoperative education, a willing caregiver, a safe social setting for postoperative recovery, and proximity to a skilled care facility. Criteria for early discharge include ability to void and take adequate oral intake (PO), stable vital signs, no wound or airway problems, thorough postoperative assessment with attention to signs of hematoma or recurrent laryngeal nerve injury, adequate pain control, and an up sloping serum calcium curve, reliable social support [4].

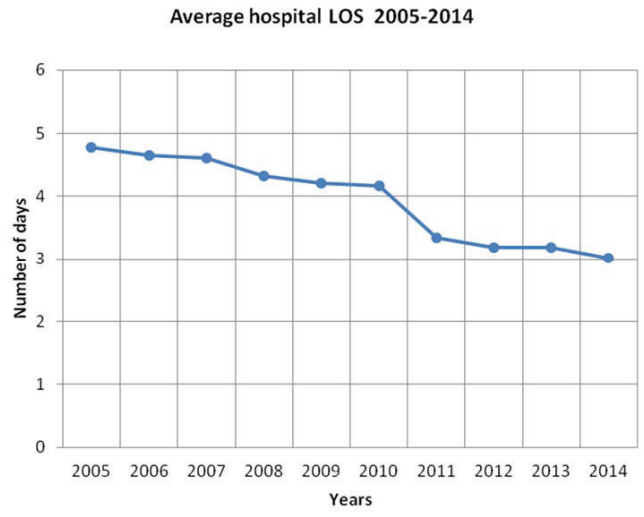
Statistical analysis was performed by χ^2 or Fisher's exact test to compare categorical variables, and t test was used to compare continuous variables between the three groups. All statistical analyses were performed by using SPSS version 19.0 (SPSS, Inc., Chicago, IL).

Results

1.1 Length of stay and grouping

A consecutive series of 3882 malignant thyroid surgery from January 2010 to December 2014 in Renj Hospital were retrospectively analyzed. There were 2850 female patients (73.4%) and 1032 male (26.6%), with a mean age of 46.49±12.29 years (ranging from 7 to 85 years). 10.25% of patients (398 cases, Group I) stayed less than 24 hours (overnight), 32.99% of patients (1281 cases, Group II) stayed between 24 hours and 48 hours, 56.75% stayed (2203 cases Group III) more than 48 hours. Mean hospital stay was 3.28 ± 1.94 days. Demographic characteristics of these patients with malignant thyroid carcinoma stayed in our hospital were shown in Table 1. The data demonstrated that 98.5% of Group I had no AHRQ chronic and/ or comorbid conditions compared with only 92.7% in Group II and 79.3% in Group III. ($p<0.001$). Figure 1 shows that the average hospital LOS of the malignant thyroid surgery patients from 2005 to 2014.

Figure 1 The average hospital length of stay of the malignant thyroid surgery patients from 2005 to 2014.



1.2 Tumor size and Tumor sides

Table 2 shows tumour size and tumour sides of these patients with malignant thyroid carcinoma. We found that the larger the neoplasm, the longer the length of hospital stay, For patients with bilateral neoplasm, the length of hospital stay was significantly prolonged .

1.3 Malignant thyroid surgery:thyroidectomy /neck dissection

Frozen section (FS) is the principal examination guiding surgical strategy. The duration in hospital is directly related to the type of the thyroidectomy (hemithyroidectomy + isthmusectomy, near total, or total) and the type of neck dissection (Central neck LN dissection, lateral + Central neck dissection)

Table 1 Demographic characteristics of patients with malignant thyroid carcinoma.

Stay in hospital	Group I	Group II	Group III		χ^2	p Value
Age	Mean age (years, SD)	46.39 ±11.36	45.88 ±12.04	46.83 ±12.54	1.82	0.403
	< 45years (n,%)	163 (40.9%)	556 (43.4%)	907 (41.2%)		
	≥ 45years (n,%)	235 (59.1%)	725 (56.6%)	1296 (58.8%)		
Gender	Male (n,%)	92 (23.1%)	347 (27.1%)	596 (27.0%)	2.85	0.240
	Female (n,%)	306 (76.9%)	934 (72.9%)	1607 (72.9%)		
Chronic/comorbid conditions		10 (2.5%)	93 (7.3%)	456 (20.7%)	169.5	1.54E-37*
Total(n)		398	1281	2203		

Group I: stay in hospital <24 hours;Group II: stay in hospital<48 hours; Group III:stay in hospital ≥ 48 hours (* p<0.05)
Chronic/comorbid conditions: central obesity, CAD cardiovascular disease, HTN hypertension, DM diabetes mellitus, DL dyslipidaemia, CKD chronic kidney disease, COPD chronic obstructive pulmonary disease, anaemia

Table 2 Tumour size and sides of these patients with malignant thyroid carcinoma.

Stay in hospital		Group I	Group II	Group III	χ^2	P Value
nodule(cm)	<1(n,%)	338(84.9%)	1033(80.6%)	1342(60.9%)	44.5	5.75E-08*
	1≤n<2(n,%)	51(12.8%)	192(15.0%)	521(23.6%)		
	2≤n<4(n,%)	9(2.3%)	49(3.8%)	259(11.8%)		
	≥4(n,%)	0	7(3.7%)	81(3.7%)		
bilateral		26(6.5%)	112(8.7%)	499(22.7%)	145.7	2.23E-32*
unilateral		372(93.5%)	1169(91.3%)	1704(77.3%)		
Total		398	1281	2203		

Nodule size: Group I vs Group II :X^2 =5.99,P=0.11;Group II vs Group III: X^2 =164.9,P=1.54E-35
Bilateral: Group I vs Group II : X^2 =1.97,P=0.16 Group II vs Group III: X^2 =108.3,P=2.26E-25
(* p<0.05)

1.4 Complication for malignant thyroid surgery

Complications were analyzed by discharge status and extent of thyroid surgery. (Table 3). There were significantly more complications in the group III vs group II and group I. Four patients with unilateral recurrent nerve palsy were staying in hospital less than 48 hours.

Postoperative vocal cords status was assessed for each patient by indirect laryngoscopy performed by an ENT specialist. Unilateral vocal cord palsy was not considered a contraindication to discharge and patients were advised to check vocal cord mobility after 2 weeks. Patients with bilateral cord palsy were not discharged, and their hospitalization was immediately converted to inpatient treatment in the same department. Laryngeal nerve injury was defined permanent if it persisted 12 months after surgery.

The reference range of serum calcium levels was 8.0–10 mg/dl. Temporary hypocalcaemia was defined as calcaemia < 8.0 mg/dl occurring after surgery and recovering within 6 months. The serum calcium level was measured in all patients undergone total thyroidectomy on the first postoperative day before discharge. Patients were asked to repeat the blood sample at day 2, and once a week for 3 weeks after the operation. Therapy was prolonged as long as necessary and progressively reduced up to complete retrieval depending on calcium levels registered at scheduled blood tests.

In the group I, 1 patient was readmitted within one week due to surgical site infection, 4 patients due to the cervical hematoma after their surgery. In the group II, 2 patients were readmitted within one

Table 3 Complications for malignant thyroid surgery (number and percentage).

Complication	Group I	Group II	Group III
Haematoma/haemorrhage	0	0	56 (2.54%)
Unilateral recurrent nerve palsy	0	4 (0.31%)	45 (2.04%)
Bilateral recurrent nerve palsy	0	0	3 (0.14%)
Acute respiratory distress	0	0	5 (0.23%)
Hypocalcaemia	0	0	22 (1.0%)
Surgical site infection	0	0	12 (0.54%)
Deep venous thrombosis pulmonary embolism	0	0	1 (0.05%)
Chyle leaks	0	0	1 (0.05%)
Patients readmitted within one week due to complications of their surgery	5 (1.26%)	11 (0.86%)	9 (0.41%)
Total	398	1281	2203

Table 5 Costs for malignant thyroid surgery (Yuan).

	Group I	Group II	Group III	Group I vs Group II		Group II vs Group III	
				t	P Value	t	P Value
Total costs	10330.4 ± 1763.9	11353.6 ± 2354.7	12267.1 ± 3819.6	27.1	<0.001	48.8	<0.001
Drug costs	1820.6 ± 753.9	2188.3 ± 1233.9	2242.1 ± 1800.2	57.9	<0.001	11.9	<0.001
Medical consumables costs	752.2 ± 614.6	762.1 ± 1295.5	730.4 ± 1101.0	2.6	0.164	0.008	0.775

week due to surgical site infection, 7 patients due to the cervical hematoma, 2 patients due to the hypocalcaemia. In the group III, 4 patients were readmitted within one week due to surgical site infection, 5 patients due to the cervical hematoma after surgery.

1.5 Cost

Total cost was also examined for the overall groups (Table 5). When taking into account all patient procedures, the total mean costs were 10330.4±1763.9Yuan ($1475.8±252.0, the yuan-dollar exchange rate of 7 yuan per U.S. dollar) in group I, 11353.6±2354.7 Yuan ($1621.9±336.4) in group II, 12267.1±3819.6Yuan ($1752.4±545.7) respectively (P<0.001) (Figure2). Total costs were significantly reduced for patients stayed less than 24 hours regardless of surgical procedure.

The drug mean costs were 1820.6±753.9Yuan ($260.1±107.7,) in group I, 2188.3±1233.9Yuan ($312.6±176.3) in group II, 2242.1±1800.2Yuan ($320.3±257.2) respectively (P<0.001) (Figure 3). Total drug were also significantly less expensive for patients stayed less than 24 hours regardless of surgical procedure.

The medical consumables mean costs were 752.2±614.6Yuan ($107.5±87.8,) in group I, 762.1±1295.5Yuan ($108.9±185.1) in group II, 730.4±1101.0Yuan ($104.3±157.3) respectively (P<0.05) (Figure 4). There was no significant difference in the medical consumables costs among these three groups.

Figure 2 Total cost for malignant thyroid surgery.

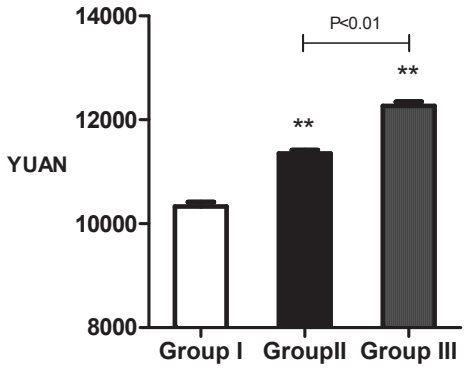


Figure 3 Drug costs for malignant thyroid surgery.

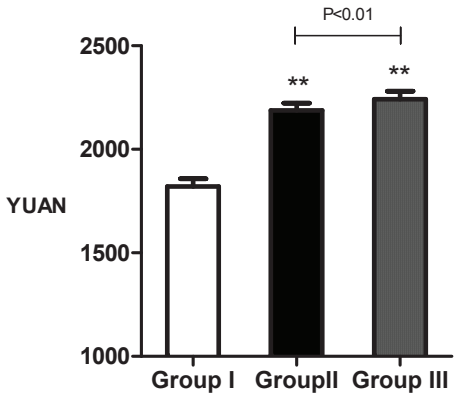
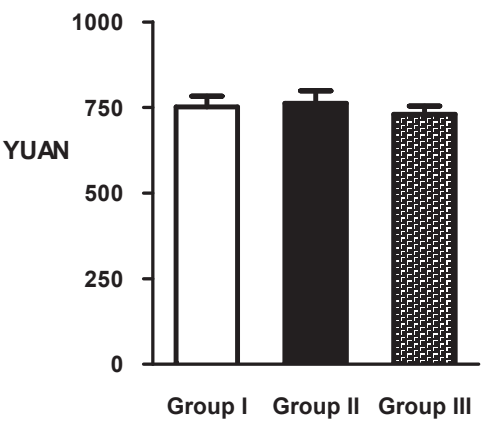


Figure 4 : Medical consumable costs for malignant thyroid surgery.



Discussion

In 1986, Steckler was the first to report on the feasibility of outpatient thyroid surgery, especially for benign thyroid surgery, concluding that it was both safe and cost effective [5]. The incidence of malignant thyroid disorders has been increasing sharply for many years in several countries, including China. According to data from the American Cancer Society, the number of new cases of differentiated thyroid carcinoma has been increasing in the last decades [6].

However, the reduction of the LOS of malignant thyroid surgery remains far from unanimous. Those who argue against the routine short stay malignant thyroid surgery, while aware of the potential hospital cost savings, maintain that this should not be at the expense of patient safety.

So the postoperative complications are the major causes for delayed discharge in our data, Patients discharged from hospital within 48 hours had no serious complications. 4 patients with unilateral recurrent nerve palsy in Group II, were also discharged earlier with the consent of these patients. Postoperative death during thyroid surgery is now rare or even unrecorded. Complications of malignant thyroid surgery are well described and including life threatening hypocalcaemia, expanding neck hematoma, and bilateral recurrent laryngeal nerve injury with potential for airway obstruction.

Technique advances in hemostasis, smaller incisions, improved

anesthesia, and rapid intraoperative parathyroid hormone assays have improved the safety and effectiveness of thyroid procedures [7,8]. But severe complications, whenever they arise, should of course delay patient discharge if ambulatory management had been planned.

The possibility of hematoma formation remains one of the major reasons for keeping patients overnight after surgery. Postoperative haemorrhage is the main concern for any thyroid surgeon, having the propensity to lead to rapid airway compromise, hypoxia and death. The majority of the postoperative bleeding (72.7 %) occurs in the first 6 hours after thyroidectomy, whereas the rest (27.3 %) developed between 6 to 24 hours [9]. Drains do not reduce the risk from this complication, but they can prevent acute airway compression, thus allowing prompt surgical intervention [10]. We found that the majority of hematomas occurred within the first 6 h after thyroidectomy requiring re-exploration. Incomplete closure of the lower strap muscles would allow any bleeding to be detected extremely early in the postoperative period as blood could easily decompress into the subcutaneous space. This would mean that significantly more bleeding would be required to cause tracheal compression [11]. It is now almost unanimously agreed that incomplete closure, or interrupted closure of the strap muscles affords significant benefits in the early detection of postoperative bleeding New devices for hemostasis and dissection proved to be safe and secure, reducing intraoperative and postoperative bleeding [12]. We initially inserted a drain into the paratracheal space to minimise the risks of haemorrhage. Currently the drain was placed only in complicated or in patients with significant dead space. Careful patient selection, careful observation of patients in the recovery room and early aggressive management of any apparent neck swellings may be the way to manage severe bleeding.

Postoperative hypocalcaemia remains a common complication following thyroid surgery. This is likely to preclude early discharge, and is thought to develop as a result of several factors including parathyroid devascularisation, injury, unintentional removal and 'stunning' from dissection [13]. Unlike haemorrhage or recurrent laryngeal nerve damage which can often be identified at surgery or early in the postoperative period, symptomatic hypocalcaemia can take much longer to manifest. Most cases of postoperative hypocalcaemia occur within 72 hr of surgery, and most develop signs more rapidly. There has been much interest about the use of intact parathyroid hormone (iPTH) to better predict hypocalcaemia after thyroidectomy. Recent studies reveled that normal postoperative PTH levels accurately predict normocalcaemia after total or complete thyroidectomy. In particular, PTH levels should id Extensive verbal communication and patient education regarding symptoms of hypocalcaemia, and prescribes postoperative calcium supplements to patients should be performed (difficult to understand). Studies have validated the role of measurement of parathyroid hormone levels (alone or in conjunction with corrected calcium levels) in patients undergone thyroid surgery and showed that this could be used as an accurate predictor of postoperative hypocalcaemia and thus help predict which patients are likely to be candidates for early discharge [14,15].

In order to avoid the injury to recurrent laryngeal nerve, one must employ meticulous techniques to identify this nerve with possible considerable anatomic variation. A strategy that can reduce the risk of recurrent laryngeal nerve injury is intraoperative electrical nerve stimulation of the surgical field in addition to visual control [16]. The consequences of bilateral recurrent nerve palsy are so severe that no surgeon will ignore it, once the hoarseness and dyspnea are simultaneously found. The symptoms of unilateral recurrent nerve palsy are relatively benign, which will not affect patients' earlier discharge.

Other factors such as: wound infection (WI) has a reported incidence of from 0.1% to 2%. There is no specific perioperative risk factor foreshadowed the development of WI; the definition of a high-risk population for this life-threatening complication remains obscure. Thyroid surgery is considered a "clean" procedure, and antibiotic prophylaxis (AP) is not indicated. The use of AP has not been shown to affect the incidence of WI. Infection occurs as a result of a breakdown in the sterile technique, and the most likely organisms are Staphylococcus Aureus and other skin contaminants. In fact, no WI usually presents within 3 days of initial operation [17]. In our data, WI is one of the main cause of unanticipated hospital readmission within one week after the surgery.

Postoperative pain is the main cause of delayed discharge. Severe postoperative pain also causes extreme discomfort and can prevent sleep, thus contributing to postoperative fatigue, limiting mobility at home, and delaying the return to normal activities. Pain following thyroidectomy results from wound cervicotomy, intraoperative cervical hyperextension that causes postoperative muscular cervicalgia, and laryngeal discomfort caused by frequent tracheal stimulation and movements of the endotracheal tube during surgical manipulation. Adequate postoperative analgesia is a prerequisite for successful ambulatory surgery. Estimates of the number of patients who suffer pain following day surgery are as high as 30–50% [18]. At present there is no randomized trial that has studied postoperative pain in detail after ambulatory thyroid surgery to understand the individual patient experience of pain, effective pain management, and the types and modes of action of various analgesics available to the ambulatory population as local, general, or regional anesthesia19. Optimal postoperative pain control for ambulatory surgery should be effective and safe, produce minimal side effects, facilitate recovery and be easily managed by patients at home. The role of opioids in day-case surgery is controversial because of their well-known side effects, especially nausea and vomiting, which can be deleterious after neck surgery. Paracetamol is the most commonly used analgesic worldwide because it is effective, cheap and safe [18,19].

In our data, in addition to surgical complications there are some other factors associated with LOS of malignant thyroid surgery. Chronic/comorbid conditions or diseases is associated with longer hospital stays for all the patients undergoing operation with malignant thyroid surgery being no exception. The tumour size of 84.9% patients in Group I is less than 1cm, no patient with tumour size larger than 4cm stayed in hospital less than 24 hours. The tumour size distribution of the three groups are significantly different; the smaller the tumour size, the shorter the LOS of malignant thyroid surgery patients. 92% of patients with a tumour larger than 4cm stayed in hospital more than 48 hours. The LOS of the patients with bilateral tumour was significant longer than those patients with unilateral tumour. In fact, the tumour size and the sides are associated with the procedure of the malignant thyroid surgery. In China, a tumour size less than 1cm is not usually recommended for total thyroidectomy and preventive lateral neck dissection, unless there is evidence of lateral neck lymph node involvement. Central neck lymph nodes dissection is a routine procedure for malignant thyroid operations, unless the patients or their families refuse it. The larger the scope of operation, the greater the risk of the postoperative complication and the longer the LOS of the malignant thyroid surgery, which has been confirmed in Table 4.

In our data, 10.25% patient in Group I (stayed less than 24 hours) was not high, the proportion of the patients in Group II (32.99%) was considerably large. The community recovery system was fairly undeveloped, the patients had reason to worry about their safety after discharge. A small number of patients suggested an excuse for refusing the earlier discharge: postoperative pain, weakness, dysphagia, etc. We believed that the proportion of malignant thyroid surgery stay in

Table 4 Malignant thyroid surgery: thyroidectomy /neck dissection.

Stay in hospital		Group I	Group II	Group III	x^2	P Value
Operation	Total thyroidectomy(n,%)	67 (16.8%)	285 (22.2%)	1130 (51.3%)		
	Near total thyroidectomy(n,%)	89 (22.3%)	416 (32.5%)	621 (28.2%)		
	Hemithyroidectomy + isthmusectomy(n,%)	242 (60.8%)	580 (45.3%)	452 (20.5%)		
Neck dissection	Central neck LN dissection (level VI)(n,%)	333 (83.7%)	1091 (85.2%)	1897 (86.1%)	1.85	0.396594317
	lateral+ Central neck LN dissection (level II-V +VI)(n,%)	0 (%)	16 (1.3%)	98 (4.5%)	42.51	5.88691E-10
Total		398	1281	2203		

Thyroidectomy:
Group I vs Group II :X^2 =29.5,P=3.88E-07 ;Group II vs Group III: X^2 = 340.8,P=9.47E-75

Neck dissection:
level VI(Central neck LN dissection):X^2 = 1.84,P= 0.396 ;
lateral neck dissection(level II-V): X^2 = 42.5,P= 5.89E-10(Group II vs Group III)

hospital less than 24hours will raise gradually with the development of medical system reform and the conversion of people's traditional concepts in the future.

In the hospital total cost mainly consists of three parts; procedure cost, drug costs, and medical consumables costs. Other expenses are less such as bed fee: 40 Yuan ($5.7) per day, and nursing care fee: 10 Yuan ($1.4) per day. When looking at total mean costs and drug cost, a clear trend to reduce costs is observed in group I compared with group II and group III. In United States 49936 patient thyroidectomies from the first quarter of 2009 to the second quarter of 2013 were collected in the University Health System Consortium (UHC) data. The overall mean cost of thyroidectomy patient was $5617 [20], which is likely to be 3 to 4 times as much as that of our malignant thyroid surgery. The duration of hospitalization is an important determinant of hospital costs. Ambulatory thyroidectomy should allow savings of 15 to 30% of the costs of hospitalization. In our data the group I allow about savings of 18% of the cost of hospitalization.

Conclusion

Short-stay surgery treatment has well-documented advantages related to the patient, hospital and government, to reach the result of co-win. Short-stay thyroid surgery requires clear and rigorous preoperative selection, discharge criteria and a multidisciplinary team with adequate professional structures and meticulous organization. An efficient structural organization is necessary to control the complication and conversion rates of the traditional hospitalization. According to our data, malignant thyroid surgery can be discharged less than 48h safely and effectively in properly selected patients in China.

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