

## Post-operative pain with and without neck extension in open thyroidectomy

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**Objective:** To compare open thyroidectomy with and without neck extension in terms of mean postoperative pain.

**Methodology:** This randomized control trial was conducted at Department of Surgery, Benazir Bhutto Hospital, Rawalpindi for a period of six months. A total 160 patients, 80 in each group, were included through non- probability consecutive sampling. In Group A, thyroidectomy was performed with standard thirty-degree reverse Trendelenburg tilt and neck extension and in Group B, there was no extension group. Visual analogue scale (VAS) was used to measure postoperative pain. SPSS version 21 was used for

data analysis.

**Results:** Males were slightly more in number (51.87%) than females (48.12%). Mean age was  $41.93 \pm 10.587$  years. Pain scores at 24 hours post-surgery were  $3.56 \pm 1.077$  in Group A and  $2.58 \pm 1.123$  in Group B ( $p < 0.05$ ).

**Conclusion:** Open subtotal thyroidectomy without neck extension caused less postoperative pain as compared to surgery with neck extension. Further randomized, multicenter large controlled trials are required to establish this fact. (Rawal Med J 202;45:84-86).

**Keywords:** Thyroidectomy, neck extension, post-operative pain, visual analogue scale.

## INTRODUCTION

Thyroidectomy is one of the commonest procedures performed on general surgical list. Pakistan with its wide belts of iodine deficient area is no exception.<sup>1</sup> Over the recent past many techniques of minimally invasive thyroidectomy has been proposed but classical open approach still holds.<sup>2</sup>

Open thyroidectomy is associated with many major and minor complications.<sup>3</sup> The most feared ones of these are recurrent laryngeal nerve and parathyroid gland injuries. To avoid these, traditionally a thirty degree head up position with neck extension providing maximum exposure is advised. This however comes at a price. Most patients complain of pain at nape in early post-operative period.<sup>4</sup> This pain is additional and different from that occurring at incision site. It is thought to originate from erector spinae spasm resulting from prolonged neck extension. Although not life threatening, this is severe enough to effect early recovery. It can also lead to multiple outpatient visits post discharge.

Recently this whole concept of neck extension and

its related benefits have been challenged. In 2014, Lange et al suggested that avoiding neck extension reduced post-operative pain without compromising exposure.<sup>5</sup> The aim of current study was to further investigate this problem and generate local data so that meaningful policies can be made.

## METHODOLOGY

This study was conducted at Department of Surgery, Benazir Bhutto Hospital, Rawalpindi from November 2014 to May 2015. Prior permission from ethical committee was taken and Informed consent was taken from all patients. Total of 160 patients were admitted as elective cases after confirming their diagnosis. This was done by taking a detailed history (including any previous chemotherapy, radiotherapy and repeated infections), thorough clinical examination and confirming thyroid function tests. Those having thyroid malignancy, retrosternal goiter, history of cervical spondylosis, rheumatoid arthritis or neck trauma were excluded.

Full blood count, coagulation profile, blood sugar

levels (random) and hepatitis screening were done as pre-anesthesia workup. Patients were randomly divided into two groups i.e. Group A and Group B by lottery method. All surgical procedures were done under standard general anesthesia. In Group A, the neck extension group, the patients were operated with full neck extension with 30-degree head up and a standard shoulder roll behind the shoulders. In Group B, no neck extension group, the patients had 30-degree head up but no shoulder roll were placed behind the shoulders. Standard Kocher's neck incision was given. After the procedure, simple T shaped gauze dressing was done. All the patients received standard analgesics and antibiotics. During the post-operative period, the pain scores were measured by VAS at 24 hours.

**Statistical Analysis:** Data were analyzed using SPSS version 21. The variables to be analyzed were quantitative data, like age and pain score and qualitative data like gender. Effect modifiers like age and gender were controlled by stratification. Post stratification independent sample t-test was applied. A  $p < 0.05$  was considered statistically significant.

## RESULTS

Total 160 patients were included in study with 80 in each group. Males were slightly more in number (52%) than females (48 %) (Table 1). Mean age was  $41.93 \pm 10.587$  years. Pain scores at 24 hours post-surgery were  $3.56 \pm 1.077$  in Group A and  $2.58 \pm 1.123$  in Group B ( $p < 0.05$ ) (Table 2).

**Table 1. Patients in each group.**

Group	Male	Female
Neck Extension	45	35
No Neck Extension	38	42
Total	83	77

**Table 2. Comparison of Mean VAS pain score between Groups 24 hours post operatively (n=160).**

Group	Mean	Standard Deviation	p-value
Neck Extension Group (N=80)	3.56	1.077	<0.001
NO Neck Extension Group (N=80)	2.58	1.123	

**Table 3. Comparison of Mean VAS pain score between Groups with stratification for age (n=160).**

Age	Group	Number	Mean $\pm$ SD	P value
25-40 years	A	35	$3.6 \pm 1.168$	<0.01
	B	38	$2.58 \pm 1.106$	
41-50 years	A	19	$3.53 \pm 1.124$	<0.03
	B	24	$2.24 \pm 1.176$	
51-60 years	A	26	$3.54 \pm 0.948$	<0.019
	B	18	$2.78 \pm 1.114$	

**Table 4. Comparison of Mean VAS pain score between Groups with stratification for gender (n=160).**

Gender	Group	Number	Mean $\pm$ SD	P value
Male	A	45	$3.6 \pm 1.09$	< 0.001
	B	38	$2.55 \pm 1.55$	
Female	A	35	$3.46 \pm 1.067$	<0.001
	B	42	$2.6 \pm 1.106$	

Stratification was done according to age and gender and the results are summarized in Tables 3 and 4, respectively. Post-operative complications like subplatysmal bleed, recurrent laryngeal nerve injury, or hypocalcemia due to parathyroid injury were not recorded in either group.

## DISCUSSION

Although goiter is predominant in females,<sup>6</sup> in this study male patients were slightly more in number. This may be due to the fact that in local culture, females usually shy away from surgery due to indigenous values.<sup>7</sup> Majority patients belonged to middle age group with a mean age of  $41.93 \pm 10.587$  years. Steps were taken to match both groups in terms of number of males and females, weight, built, comorbidities and size of goiter. Those with huge sized glands or previous long-standing history of neck pain or trauma were excluded from study as these factors could have been responsible for pain. To further simplify, people with BMI class 3 or above were also excluded.

A thirty-degree head up reverse Trendelenburg position was made in all patients. However, the shoulder roll under neck was placed only in group B. Same operation theater staff and pillow were used in all cases to avoid discrepancy. The method of checking degree of neck extension was according to the study by Lange et al.<sup>5</sup> They used distance between cricoid cartilage and sternal notch as proxy for degree

of extension. This was obviously more in group A. T-test showed VAS to be significantly less in No extension group. This was valid for both genders and all age groups ( $p < 0.05$ ). This is similar to study conducted by Lange et al.<sup>5</sup> It is understandable as excessive extension probably causes strain or spasm of erector spinae muscles. This premise can be further confirmed in more sophisticated studies by electromyographic monitoring of neck extensors during and after surgery.

The study had a few limitations; chief being its small sample size. In fact, no neck extension means compromised exposure. While not bothering experienced surgeons, in juniors this hindrance can translate into increase complication rate. Two well-known and most commonly litigated, complications are recurrent laryngeal nerve and parathyroid gland injuries.<sup>8,9</sup> Although none of these were recorded in present study yet, hypothetically, avoiding neck extension might increase chances of both. This obviously calls for further studies with preferably larger sample size before completely abandoning the time tested classical position.

## CONCLUSION

Open subtotal thyroidectomy without neck extension caused less postoperative pain as compared to surgery with neck extension.

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Conception and design: Nida Farrukh  
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**Conflict of Interest:** None declared  
Rec. Date: Sep 7, 2018 Revision Rec. Date: Dec 8, 2019 Accept Date: Dec 23, 2019

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