

## Original Research Article

# Our experience of 200 cases of thyroid surgery under local anaesthesia versus general anaesthesia

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### ABSTRACT

**Background:** Local Anaesthesia is now being accepted universally as a safe alternative to general anaesthesia for thyroid surgery. This study was carried out to compare the outcomes of patients undergoing thyroid surgery under local and general anaesthesia.

**Methods:** 200 patients who underwent thyroid surgery for benign and malignant diseases under local and general anaesthesia from March 2014 to March 2017 were analysed. Patient characteristics analysed were age, sex, pathology lesion size, operating time, length of stay, cost and post-operative complications.

**Results:** Mean lesion sizes were 4.5 cms and 6.5 cms in local and general anaesthesia group respectively. Mean operating time was 50, 5 minutes and 75.5 minutes in local anaesthesia and general anaesthesia group respectively. Mean cost incurred was Rs. 2500 in local anaesthesia and Rs. 5500 in general anaesthesia group. Mean length of hospital stay was 40, 25 hours and 75.06 hours in local anaesthesia and general anaesthesia group respectively.

**Conclusions:** Local anaesthesia is a safe alternative to general anaesthesia for patients undergoing thyroid surgery. Use of local anaesthesia has resulted in a decreased length of stay, cost and means operating time, hence useful in a setup with limited anaesthesia time and increased work load.

**Keywords:** Local anaesthesia, Thyroid surgery, General anaesthesia

### INTRODUCTION

Thyroid surgery for benign and malignant diseases is most commonly performed under general anaesthesia. Historically, surgery in patients with thyroid disease especially thyrotoxicosis was performed using local anaesthesia.<sup>1</sup> As medical therapy evolved to provide reliable means of maintaining euthyroid state and as general anaesthesia became safer, many procedures including thyroid surgery are being done exclusively under general anaesthesia. However, over the last three decades, there has been resurgence in number of thyroid operations under local anaesthesia.<sup>2-4</sup> Local anaesthesia can provide good analgesia and avoids major side effects of general anaesthesia. In addition, the analgesia

continues in the post-operative period, thus modifying the autonomic and endocrine stress of surgery leading to rapid recovery.<sup>3</sup> Local anaesthesia is economical and simpler to administer and thus fulfils the requirements for Day care surgery.<sup>5-7</sup> A few surgeons in the west are carrying out thyroid surgery exclusively under local anaesthesia and cervical blocks after careful patient selection and propagating the effectiveness of such approach.<sup>8</sup> We attempt to analyse the characteristics of patients undergoing surgery under local and general anaesthesia and evaluate the outcome measures in terms of the cost effectiveness, hospital stay and complications in this retrospective Cohort study. The aim of the study was to evaluate the efficacy of thyroid operations done under local anaesthesia and whether this can pave way a

for the development of thyroid surgery as an outpatient procedure.

## METHODS

The records of all patients who underwent thyroid surgery for benign and malignant thyroid diseases under local and general anaesthesia were evaluated. Two hundred patients operated in a single ENT surgical unit at our Hospital over the period of March 2014 to March 2017 were included. Local anaesthesia was discussed preoperatively with all patients and in general the patient made the decision regarding type of anaesthetic used during operation. The exclusion criteria for local anaesthesia were substernal goitre, allergy to local anaesthesia, obese short neck, concomitant procedures and neck dissections. Those who did not give consent for local anaesthesia were also excluded. All cases were performed by an ENT surgeon. The patients were allocated the anaesthetic group alternately on outpatient basis and patients were informed about the procedure in detail. They were also informed that the procedure can be converted to general anaesthesia at any time, if circumstances so dictate.

### Technique of local anaesthesia

Patients were premedicated with 0.25 – 0.5 mg alprazolam orally at bed time on the night before surgery and repeated 2 hours before surgery in morning. Patients were sedated in the pre operating room using a mixture of pentazocine and promethazine according to body weight. They were able to respond to verbal commands

depending upon their level of sedation. Local anaesthesia (0.5% lidocaine with 1:100000 adrenaline) was injected with 26 gauge needle, in the incision line first and then infiltrated in to superior and inferior skin flap. Surgery was performed in presence of an anaesthetist under constant monitoring. After operation, all patients were monitored in the recovery room. Antiemetics and analgesics were given as needed. Ceftriaxone 1 gm IV was given as prophylactic antibiotics.

### Technique of general anaesthesia

Premedication with 0.25 – 0.5 mg of Alprazolam orally at bed time on the night before and repeated 2 hours before surgery in the morning. Patients were induced with propofol, succinyl choline or vecuronium, nitrous oxide and reversed by myostigmine and glycopyrrolate. Monitoring was done in recovery room. Prophylactic antibiotics, antiemetics and analgesics were administered as before.

## RESULTS

Patient characteristics like age sex duration size of swelling studied during March 2014 and March 2017, a total of 200 patients with both benign and malignant thyroid diseases were operated in a single ENT surgical unit under local anaesthesia. Age of the patients ranged from 20 -65 years in local anaesthesia and 18 – 65 years in general anaesthesia group. The mean age in local anaesthesia group was 34.5 years and 37.5 years in general anaesthesia group. The histopathological characteristics and operation done is given in Table 1.

**Table 1: Comparison of clinicopathological features between local and general anaesthesia groups.**

|                            | Local anaesthesia group<br>n =100 | General anaesthesia group<br>n=100 |
|----------------------------|-----------------------------------|------------------------------------|
| <b>Age</b>                 | 34.5 years [20-65 years]          | 37.5 years [18-65 years]           |
| <b>Gender</b>              |                                   |                                    |
| Male                       | 6                                 | 8                                  |
| Female                     | 94                                | 92                                 |
| <b>Pathology</b>           |                                   |                                    |
| <b>Benign</b>              |                                   |                                    |
| Solitary                   | 50                                | 30                                 |
| Multinodular               | 15                                | 50                                 |
| Colloidal                  | 25                                | 10                                 |
| <b>Malignant</b>           |                                   |                                    |
| Papillary                  | 5                                 | 6                                  |
| Follicular                 | 5                                 | 4                                  |
| <b>Lesion size</b>         | 4.5 cm [2.3-8.5cm]                | 6.5 cm [4.5-12 cm]                 |
| <b>Operation type</b>      |                                   |                                    |
| Hemithyroidectomy          | 75                                | 60                                 |
| Subtotal thyroidectomy     | 15                                | 30                                 |
| Total thyroidectomy        | 20                                | 10                                 |
| <b>Mean operating time</b> | 50.5 min [30.3-60.5 min]          | 75.5 min [60.5-99.5 min]           |
| <b>Mean cost</b>           | 2500 Rs                           | 5500 Rs                            |

**Table 2: Complications in local and general anaesthesia.**

|                                       | Local anaesthesia group<br>n=100 | General anaesthesia group<br>n=100 |
|---------------------------------------|----------------------------------|------------------------------------|
| <b>Hypocalcemia</b>                   | 0                                | 1                                  |
| <b>Vocal cord palsy</b>               | 2                                | 3                                  |
| <b>Conversion to GA</b>               | 0                                | 0                                  |
| <b>Bleeding [hematoma infection ]</b> | 5                                | 7                                  |
| <b>Respiratory distress</b>           | 0                                | 1                                  |
| <b>Hypothyroidism</b>                 | 0                                | 0                                  |
| <b>Total</b>                          | 7                                | 12                                 |

**Table 3: Length of stay.**

| Length of stay in hrs       | Local anaesthesia group<br>n=100 | General anaesthesia group<br>n=100 |
|-----------------------------|----------------------------------|------------------------------------|
| <b>&lt;24 hours</b>         | 26                               | 0                                  |
| <b>24 hours to 48 hours</b> | 40                               | 28                                 |
| <b>&gt;48 hours</b>         | 34                               | 72                                 |
| <b>Mean length of stay</b>  | 40.26 hours                      | 75.06 hours                        |

Operative data, the mean operating time, defined from entry into operating room to entry into recovery room, was 50.5 minutes (range 30.3 – 60.5 minutes) in local anaesthesia group and 75.5 minutes (range 61.5 – 99.4 minutes) in general anaesthesia group as shown in Table 1. The difference was statistically significant. There were no specific operative difficulties encountered in the local anaesthesia group. Drain was inserted below the strap muscle which were kept for 12 to 24 hour then removed. The patients were kept in the recovery room after surgery where monitoring was done for signs of bleeding, respiratory obstruction and pain. The mean analgesia requirement was less in the post-operative period in the local anaesthesia group. Intramuscular tramadol was used for post-operative analgesia. One patient developed symptoms of hypocalcaemia in general anaesthesia group as shown in Table 2. Oral feeding was started from the same evening. Drain was removed on the next morning. Surgical complications that were evaluated were bleeding, respiratory obstruction, hypoparathyroidism, hypocalcaemia, vocal cord paralysis, haematoma, seroma, infection and conversion to general anaesthesia. There were episodes of hypocalcaemia seen in one patient, haematoma or infection seen in 7 patient, seroma was seen at wound site in 3 patients, vocal cord palsy seen in 3 patient, respiratory obstruction seen in 1 patient of general anaesthesia group as shown in Table 2. Vocal cord paralysis was seen in 2 patients and hematoma infection in 5 patient of local anaesthesia group as shown in Table 2. The seroma subsided spontaneously after aspiration of seroma with fine needle. Few patients had transient nausea and vomiting which subsided with medication. Mean cost refers to the cost incurred on patient from admission till discharge. Mean cost incurred was Rs.2500 in local anaesthesia group and Rs.5500 in general anaesthesia group. In this study we have study the mean length of hospital stay was 40, 26 hour in local

anaesthesia group and 75.06 hour in general anaesthesia group as shown in Table 3.

## DISCUSSION

Since Koller introduced local anaesthesia in 1884, the technique has undergone progressive refinement and it is now being increasingly accepted as a modality of choice in various surgical specialities.<sup>9,10-12</sup> Local anaesthesia is a safe alternative to general anaesthesia. The basic objective of our study was to review our experience with local anaesthesia concerning the safety and outcome in this approach. The reasons usually quoted for the failure of this technique are fear of failure, time taken for induction and fear of neurological complications.<sup>13</sup> Inadvertent intravascular injection of local anaesthesia may lead to seizure activity.<sup>14</sup> The systemic toxic effects of local anaesthesia are related to the blood concentrations of specific agents, which in turn are regulated by the rate of vascular absorption, tissue distribution, metabolism and excretion.<sup>13</sup> Although we did not encounter any complication of local anaesthesia and there was no need of converting the procedure to general anaesthesia. Series ranging from hemithyroidectomy to total thyroidectomy were performed using this method without any significant complication. Complication rates in local anaesthesia group were comparable to those of general anaesthesia with very few incidence of life threatening complications like haemorrhage laryngeal spasm, tetany hypocalcaemia, vocal cord paralysis infection or conversion to general anaesthesia. A few patients developed nausea and vomiting but could be managed symptomatically. Similar results have been reported by Hisham et al who operated 65 patients with comparable figures.<sup>15</sup> A large number of parathyroid surgeries and neck explorations are being performed under local anaesthesia.<sup>16-19</sup> The technique of thyroid surgery under local anaesthesia and cervical

blocks pioneered by surgeons such as Lo Gerfo has indeed been a revolution.<sup>3</sup> In spite of his excellent results, the concept has been plagued by controversies. He has modified the conventional techniques, though slightly, and brought out remarkable results. Quick postoperative recovery and discharge from the hospital thus cut down the cost incurred by the patient. This is particularly important in a country where a vast majority of patients are poor and can't even afford the basic necessities of life. Also, due to limited number of trained anaesthesia personnel, and increasing burden of patients, the technique becomes a boon, being economically feasible. Pain analysis, both during and post operation was not carried out in our study. Advocators of local anaesthesia have carried out such analysis and found that it was much less than patients on general anaesthesia. When we compared the post-operative requirement of analgesic, it was much less in the local anaesthesia group *vis a vis* general anaesthesia group in our study.

## CONCLUSION

Our study highlights the emerging trend that thyroid surgery under local anaesthesia is as safe, efficacious and cost effective as under general anaesthesia. It might be performed as a day care surgery in future and thus improves the quality of life of these patients.

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