INTRODUCTION:
Providing safe and effective anaesthesia for thyroid surgery can sometimes become a problem for the anaesthetists. This becomes relevant especially in large goitres which compresses or deviates the trachea from its normal position. Endotracheal intubation is difficult in such cases and in large goitres can be hazardous \(^1,^2\). It is possible to perform thyroidectomy under bilateral superficial or deep cervical plexus block and it is a useful alternative to general anaesthesia in particular circumstances \(^3-^4\). Also the goitre might be associated with thyroid functional disorders. Patients with both hypo and hyperthyroidism are prone to cardiac rhythm disorders which might get aggravated under the influence of general anaesthetic agents \(^5-^7\).

Regional anaesthesia techniques are safer than general anaesthesia in high risk patients, where endotracheal intubation is difficult or cardiac arrhythmias are anticipated. For thyroid surgery, regional anaesthesia is not a conventionally described option. Cervical plexus block has been used for operations in the neck and shoulder, particularly on the thyroid gland. It may also be used as a modality of pain therapy in this region \(^6\). Here, we shall describe our experiences of using this technique for thyroid surgery.

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Materials and Methods:
The technique of cervical plexus block was used in 9 patients, who underwent thyroid surgery in Bangabandhu Sheikh Mujib Medical University (BSMMU) Hospital, Dhaka, over a period of 18 months from July 2008 to September 2010.

Preoperative patient assessment for planned regional technique is done including all the concerns present for acceptability to undergo general anaesthesia. The decision to perform a regional block was made in collaboration with the patient, the anaesthetist and the surgeon himself. The patient gave consent for regional anaesthesia as well as general anaesthesia. The anaesthetist had an overall monitoring of the patients during surgery. Patients’ refusal and presence of infection, confirmed by insertion of a needle at the site, were considered as contraindications.

Technique of cervical plexus block:
For superficial block, the subcutaneous tissues were infiltrated in a fan like fashion in the line of the posterior border of sternocleidomastoid muscle in and around its midpoint (Fig.1). This anaesthetizes the skin only. During superficial cervical plexus block, the local anaesthetic agent is injected deep to the investing fascia rather than subcutaneously. The anaesthetic agent spreads to the deep spaces making anaesthesia more effective.

For deep block, the needle is directed towards the transverse process of the third cervical vertebra, at right angles to the skin and pointing slightly caudal. It is advanced 1.5-3cm depending on the soft tissue thickness of neck, so as to contact bone or elicit a paraesthesia. Before injecting the local anaesthetic agent, careful aspiration is done to detect blood or CSF (Fig.2).

Drugs and dosage for anaesthesia:
10ml of 2% Lignocaine with adrenaline (1:200000) or 0.50% Bupivacaine was used as surface anaesthetic agent, Inj. Pathedine 100mg, Inj. Ketorolac 30mg, Inj. Prochlorperazine 12.5mg were given intramuscularly.

Results:
Nine cases of thyroid disorders were operated, where lobectomy was done in 2 cases, hemithyroidectomy in 4 cases, isthmusectomy in 1 case, subtotal thyroidectomy in 1 case and total thyroidectomy in 1 case (Table-I).

Fig.-1: Superficial cervical plexus block performed by using a fan like injection at the midpoint of posterior border of sternocleidomastoid muscle.

Fig.-2: Deep cervical plexus block: surface marking for cervical vertebrae (left) and injecting local anaesthetic agent (right).

Fig.-3: Subtotal thyroidectomy being performed under regional anaesthesia (left) and the patient just after the operation was done (right).
Table I

Procedure performed (n=9).

<table>
<thead>
<tr>
<th>Name of surgery</th>
<th>No. of patients</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lobectomy</td>
<td>02</td>
<td>22.22</td>
</tr>
<tr>
<td>Hemithyroidectomy</td>
<td>04</td>
<td>44.44</td>
</tr>
<tr>
<td>Isthmusectomy</td>
<td>01</td>
<td>11.11</td>
</tr>
<tr>
<td>Subtotal Thyroidectomy</td>
<td>01</td>
<td>11.11</td>
</tr>
<tr>
<td>Total thyroidectomy</td>
<td>01</td>
<td>11.11</td>
</tr>
</tbody>
</table>

The advantages that we observed were less bleeding, time saving procedure, avoidance of endotracheal intubation, physical ability of the patient to take food and drink immediately at post operative period and early mobility of the patient after the operation. One patient developed bradycardia and hypotension peroperatively which was managed safely by intravenous inj. Atropine (0.6mg) without any remarkable consequences. Postoperative complication that we faced was temporary dysphagia in one case. However, it recovered spontaneously within 50 minutes after the operation was done (Table II).

Table II

Complications of thyroid surgery (n=09).

<table>
<thead>
<tr>
<th>Complications</th>
<th>No. of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excessive Bleeding</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Technical difficulty</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Conversion to another technique of anaesthesia</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Anaesthesia related morbidity (Hypotension, bradycardia)</td>
<td>01</td>
<td>11.11</td>
</tr>
<tr>
<td>Postoperative temporary dysphagia</td>
<td>01</td>
<td>11.11</td>
</tr>
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Discussion:

Providing safe anaesthesia for thyroid surgery can sometimes be a difficult task for two reasons e.g. the possibility of tracheal deviation or compression because of enlarged thyroid, and hemodynamic disturbances including arrhythmias and hypotension related to the functional status of the thyroid. Conventional general anaesthesia with endotracheal intubation may not be possible every time and it is hazardous in certain situations. Endotracheal intubation can become a traumatic procedure precipitating laryngeal oedema occasionally. Like other situations where general anaesthesia becomes a high risk proposition, regional anaesthesia is considered the safer alternative although not practiced routinely.

Cervical plexus block has been used mainly for neck, shoulder and upper thoracic wall surgery. It has also been used for carotid artery surgery, parathyroid surgery, neck dissection for head and neck cancers and for the treatment of complex regional pain syndromes of the upper limb. Adequate surgical anaesthesia with a high degree of patient acceptance has been reported by all authors. Failure of the technique or the need to convert to an alternative method of anaesthesia has not been reported in the literature.

The main reasons why cervical plexus block has not come into wide clinical usage are fears of its potential complications. These include puncture of vertebral artery, epidural subarachnoid spread and bilateral phrenic nerve block and its effect on respiratory function. We found that cervical plexus block did not have any effect on respiratory functions. None of our patients had changes in breathing pattern or fall in peripheral arterial oxygen saturation as observed through a pulse oxymeter. Acute paralysis of the diaphragm would produce violent contractions of the abdominal muscles as a compensatory mechanism which was not found in any of our patients. Besides, none of them developed pulmonary atelectasis post operatively.

Another major concern with cervical plexus block is its effects on heart rate and hemodynamic stability. Cervical plexus block can result in cardiac sympathectomy, which in turn depresses phasic and tonic dynamic modulation of the cardiac cycle. This can lead to a decrease in heart rate and mean arterial pressure. Therefore, most frequently reported side effects of cervical plexus block are hypotension and bradycardia.

All of our patients were operated under regional anaesthesia and maintained in a state of conscious sedation. By allowing a continuous...
verbal communication with the patient, early
detection of the possibility of recurrent
laryngeal nerve injury could be readily
diagnosed during thyroid surgery.

Survey showed that 95% of the patients rated
the level of pain equivalent or less severe than
dental procedures under local anaesthesia. It
had a lower morbidity and higher patient
satisfaction\textsuperscript{10}. Most of the patients were
discharged from the hospital within 6 to 8 hours
after operation and these discharges were not
associated with readmission\textsuperscript{10}.

\textit{Limitations of this study:}

We excluded malignant cases with deep tissue
or carotid sheath infiltrations or cases with
extensive regional metastasis, and the
numbers of cases were too small to be
conclusive in some facts.

\textbf{Conclusion:}

Review of literatures and experience of this
study showed that regional anaesthesia is a
safe and reliable alternative to general
anaesthesia due to its minimal complications
and higher patient satisfaction. The acquisition
of this skill is easy for the otolaryngologist
because of their knowledge in anatomy of the
neck.

\textbf{References:}

1. Khanna R, Singh DK. Cervical epidural
    anaesthesia for thyroid surgery. Kathmandu Univ

2. Kolawole IK, Rahman GA. Emergency
    thyroidectomy in a patient with severe upper
    airway obstruction caused by goiter: case for
    regional anaesthesia. J Natl Med Assoc. 2006;

3. Kulkarni RS, Braverman LE, Patwardhan NA.
    Bilateral cervical plexus block for thyroidectomy
    and parathyroidectomy in healthy and high risk
    714-8.

4. Klein SM, Greengrass RA, Knudsen N, Leight
    G, Warner DS. Regional anesthesia for
    thyroidectomy in two patients with amioderone-
    induced hyperthyroidism. Anesth Analg. 1997;

5. Lo Gerfo P. Outpatient thyroid surgery. J Clin
    Endocrinol Metab. 1998; 83(4): 1097-1100.

6. Lo Gerfo P, Ditkoff BA, Chabot J, Feind C. Thyroid
    surgery using monitored anesthesia care: an
    alternative to general anesthesia. Thyroid. 1994;


8. Kallgren MA. Blocks of the Neck and Upper
    eds. International Practice of Anaesthesia.

9. Pandit JJ, Dutta D, Morris JF. Spread of injectate
    with superficial cervical plexus block in humans:
    733-5.

10. Lo Gerfo P. Local/regional anesthesia for
    thyroidectomy: evaluation as an outpatient