

REGIONAL ANAESTHESIA IN THYROID SURGERY: A SAFE AND EFFECTIVE ALTERNATIVE TO GENERAL ANAESTHESIA

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Abstract:

Context: Cervical plexus block anaesthetizes the pain sensitive structures in the neck, shoulder and skin of upper chest up to sternal angle which is suitable 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. The aim the study was to find out the advantages and disadvantages of thyroid surgery under regional anaesthesia i.e. cervical plexus block.

Methods: Nine cases of thyroid disorders were operated in Bangabandhu Sheikh Mujib Medical University (BSMMU) Hospital, Dhaka, over a period of 18 months from July 2008 to September 2010, 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.

Results: 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. The only disadvantage that we faced was temporary dysphagia in one case.

Key words: Cervical plexus block, regional anaesthesia, thyroid surgery.

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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 circumstances²⁻⁴. 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 agents⁵⁻⁷.

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 region⁶. 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. He 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 only⁸. During superficial cervical plexus block, the local anaesthetic agent is injected deep to the investing fascia rather than subcutaneously. The anaesthetic

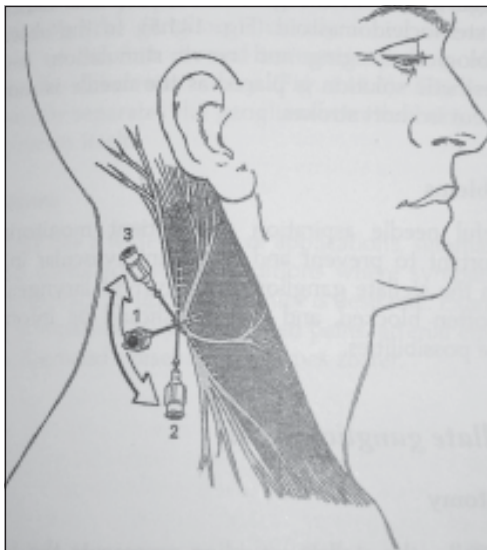


Fig.-1: Superficial cervical plexus block performed by using a fan like injection at the midpoint of posterior border of sternocleidomastoid muscle⁸.

agent spreads to the deep spaces making anaesthesia more effective⁹.

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 paraesthesia⁸. Before injecting the local anaesthetic agent, careful aspiration is done to detect blood or CSF⁹ (Fig.2).

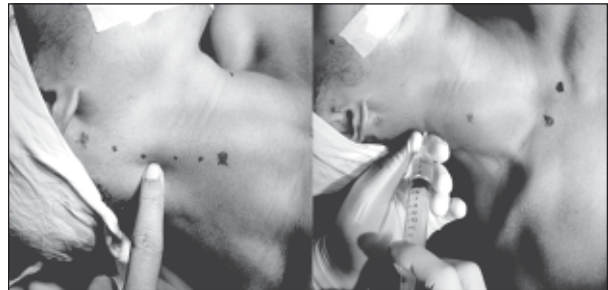


Fig.-2: Deep cervical plexus block: surface marking for cervical vertebrae (left) and injecting local anaesthetic agent (right).

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.



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

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).

Table-I
Procedure performed (n=9).

Name of surgery	No. of patients	Percentages
Lobectomy	02	22.22
Hemithyroidectomy	04	44.44
Isthmusectomy	01	11.11
Subtotal Thyroidectomy	01	11.11
Total thyroidectomy	01	11.11

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).

Complications	No. of cases	Percentage
Excessive Bleeding	-	-
Technical difficulty	-	-
Conversion to another technique of anaesthesia	-	-
Anaesthesia related morbidity (Hypotension, bradycardia)	01	11.11
Postoperative temporary dysphagia	01	11.11

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 routinely¹⁻⁴.

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^{8,10}.

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 function⁷. 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 satisfaction¹⁰. Most of the patients were discharged from the hospital within 6 to 8 hours after operation and these discharges were not associated with readmission¹⁰.

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.

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.

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