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Review Article

Scalp block: The forgotten technique –A review article

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ABSTRACT

Majority of neurosurgical procedures are performed under general anaesthesia. It is still possible to perform some of the procedures under regional anaesthesia like scalp block. It involves blocking the nerves that innervate the scalp. The technique is easy to perform, but the practitioners should be aware of possible complications because of closer relation of blood vessels with nerves. Despite various advantages over general anaesthesia scalp block is not practiced routinely. This article reviews the relevant anatomy and technique of scalp block.

1. Introduction

Regional anaesthetic techniques have a well established role in head and neck surgery. Majority of neurosurgical procedures are performed under general anaesthesia but it is possible to perform procedure like burr hole under scalp regional block. The scalp block involves regional anaesthesia to the nerves that innervate the scalp. Because of the close proximity of many nerve and vascular structures in this region, practitioners should be familiar with possible complications. This block is used perioperatively along with Inj Bupivacaine, which will cover both pre and postoperative pain.[1,2] The scalp block maintains hemodynamic parameters and it was found that inflammatory response due to surgery has come down drastically.[3] This block can also be used successfully among pediatric patients who are undergoing neurosurgery.[4]

The success of scalp block is mainly depends upon the correct positioning of the needle tip in the perineural sheath, prior to the injection of local anaesthetic.[5] This is achieved only with knowledge of correct anatomical land marks of the nerves that innervate the scalp. This article explains relevant anatomy, reviews the technique of scalp block and its complications.

2. Performance of The Block

With aseptic precautions skin wheal is raised at all the landmarks.

2.1. Drugs

8ml of Inj.Lignocaine (2%) with Adrenaline (1:2, 00,000) + 8ml of 0.5%, Inj. Bupivacaine.

2.2. Supraorbital and supratrochlear nerve block

The frontal nerve enters the orbit at the superior orbital fissure and divides into the supraorbital and supratrochlear nerves.

2.3. Technique

Palpate for the supraorbital notch. Supraorbital nerve is blocked with 3 ml of local anaesthetic mixture which is

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injected just above the notch & eyebrow with 22 G needle perpendicular to the skin.

Then another 2 ml is injected to block Supratrochlear nerve at the point where the bridge of the nose meets the supraorbital ridge, i.e. the superior medial corner of the orbit.

3. Auriculotemporal Nerve Block

The auriculotemporal nerve is the posterior branch of the Mandibular branch of the trigeminal nerve. It passes between the external auditory canal and the temporo mandibular joint and passes through the parotid gland to ascend with the superficial temporal artery over the zygomatic arch. It gives sensation to skin of the temporal region and lateral part of the scalp. Various latest local anaesthetics alone or in combination with lignocaine has been used for scalp block successfully.[5,6]

With the advent of newer technology the scalp block is successfully performed using ultrasound machine. Various study should the success rates are more compared to blind technique.[7,8]

3.1. Technique

The auriculotemporal nerve is blocked with 3 mL of solution, 1.5 cm anterior to the ear at the level of the tragus. With the needle perpendicular to the skin, infiltration of 1.5 mL was made to the deep fascia and another 1.5 mL superficially as the needle was withdrawn.

The postauricular branches of the greater auricular nerve is blocked with 2 mL of solution between skin and bone, 1.5 cm posterior to the ear at the level of the tragus.

3.2. Posterior auricular nerve

The posterior auricular nerve gives sensation to the posterior aspect of the ear.

3.3. Technique

The posterior auricular nerve is blocked by injecting 2ml of local anaesthetic mixture 1.5cm posterior to the ear at the level of the tragus between the skin and bone.

4. Greater and Lesser Occipital Nerve Blocks

These nerves arise from the C-2 & C-3. Greater occipital nerve gives sensation to the medial portion of the posterior scalp. This nerve supplies the cranial surface of the pinna and adjacent scalp.

4.1. Technique

The greater occipital nerve runs with the occipital artery and can be blocked by injecting 5-10 cc of local anaesthetic at the level of the superior nuchal line midway between the midline of the neck and the posterior border of the mastoid process. The lesser occipital nerve is blocked by injecting 1 inch inferior and medial to this area. The occipital artery can often be palpated and used as a landmark for injection of both areas.

5. Complications

1. Inadvertent injection of local anaesthetic intravascularly
2. Hematoma formation due to vascular injury
3. Permanent nerve damage
4. Local anaesthetic allergy
5. Transient facial nerve palsy

6. Discussion

Burr hole and Craniotomy are the most commonly performed during neurosurgery. Scalp block can be used as a sole technique for burr hole surgery or as an adjunct with general anaesthesia during Craniotomy. Mayfield head holder causes increased hemodynamic response due to periosteal nerve endings stimulation. Such an inadvertent hemodynamic response can be prevented with the scalp block.

The scalp is densely innervated with C fibres and because the main cause of pain in this category of patients comes from the skin incision and muscle retraction rather than from brain manipulation or resection.[9] Hence blocking of these nerves will definitely abolish pain.

The scalp block can also be performed by infiltrating dilute concentration of local anaesthetic around the scalp in a band form. This requires more volume of local anaesthetic which in turn increases the chances of local anaesthetic toxicities due to rich vascularity.

The advantages of scalp block are,

1. Reduced local anaesthetic toxicity
2. Specific nerve block depending on surgery
3. Dense blockade of surgical area
4. Post operative analgesia
5. Cost effective

Even though this technique is very efficient and easy to perform it is not free from the draw backs. One of the specific drawback is transient facial nerve palsy which is due to unintentional injection or diffusion of local anaesthetic into the deeper planes during auriculotemporal nerve block.[10] This was observed in our study. This possible complication has to be kept in mind while performing scalp block.

7. Conclusion

1. Regional anaesthesia of the scalp (scalp block) can be used alone or in combination with general anaesthesia as a safe and effective technique in cranial surgeries.

2. Scalp block deserves to be more widely used technique in routine neurosurgical cases.
3. Nerve block techniques to achieve regional anaesthesia are an essential skill in the primary care setting. Although easy to perform, these techniques require knowledge of the anatomy of the area being injected.

8. Source of Funding

None.

9. Conflict of Interest

None.

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