

# **Complications of local anesthesia**

Local anesthetic injection may produce local complications and/or general complications.

## **A- Local complications:**

**1- Pain on injection**

**2-Parasthesia**

**3- Hematoma**

**4-Trismus**

**5- Infection**

**6-Facial nerve paralysis**

**7- Broken needles**

**8-Double and blurred vision**

### **1-Pain on injection**

An injection technique that is too rough, a dull needle, rapid deposition of solution, or a barb on the needle can cause pain . If a needle is used for more than 3 penetrations or if it comes into contact with bone, check it for barbs and dullness and change it if necessary.

A mild burning sensation during administration may be due to the pH of the solution, contamination of the local anesthetic, or a solution that has been warmed too much. The mild burning of the acidic local anesthetic solution is unavoidable, and will dissipate -as the anesthetic takes effect. If the cartridge is soaked in solutions, the semipermeable membrane will allow diffusion into the anesthetic. Contaminated solution can lead to trismus or infection.

## **2- Parasthesia**

If the needle passes through a nerve in the area of injection, it may damage the nerve and cause parasthesia. The injury is usually not long term or permanent. Make a note in the chart if the patient reports a shooting feeling during the injection that would indicate needle contact with the nerve. A local anesthetic that has been contaminated by alcohol or a sterilizing solution may cause tissue irritation and edema, which will in turn constrict the nerve and lead to parasthesia. Proper injection protocol and care of the dental cartridges will reduce the incidence of parasthesia, but it can still occur.

If the patient calls reporting parasthesia, explain to them that it is not an uncommon result of an injection and make an appointment for examination. The condition may resolve itself within 2 months without treatment. Examine the patient and schedule them for re-examination every 2 months until sensation returns. If the parasthesia continues after one year, refer the patient to a neurologist or oral surgeon for a consultation. If further dental treatment is required in the area, use an alternate local anesthetic technique to avoid further trauma to the nerve.

## **3-Hematoma**

The needle can nick vessels as it passes through highly vascular tissues. A nicked artery will usually result in a rapid hematoma, while a nicked vein may or may not result in a hematoma.

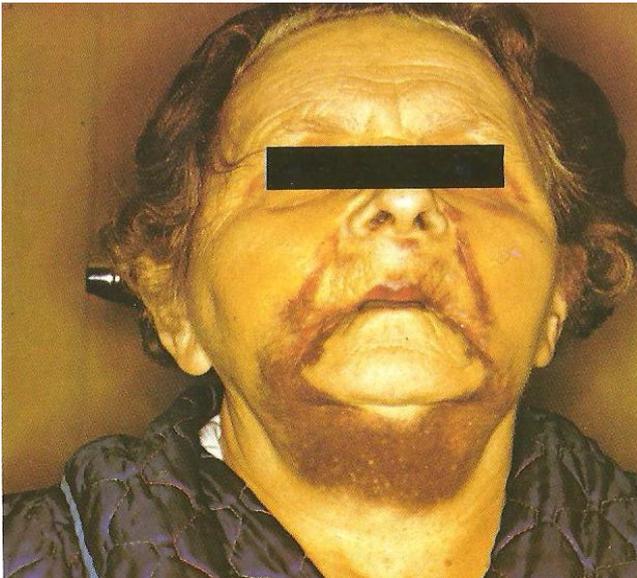
Hematomas most often occur during a posterior superior alveolar or inferior alveolar nerve blocks. Use a short needle for the PSA and be conscious of depth of penetration for these injections.

If the hematoma develops during an inferior alveolar nerve block, apply pressure to the medial aspect of the mandibular ramus. The manifestations will usually be intraoral.

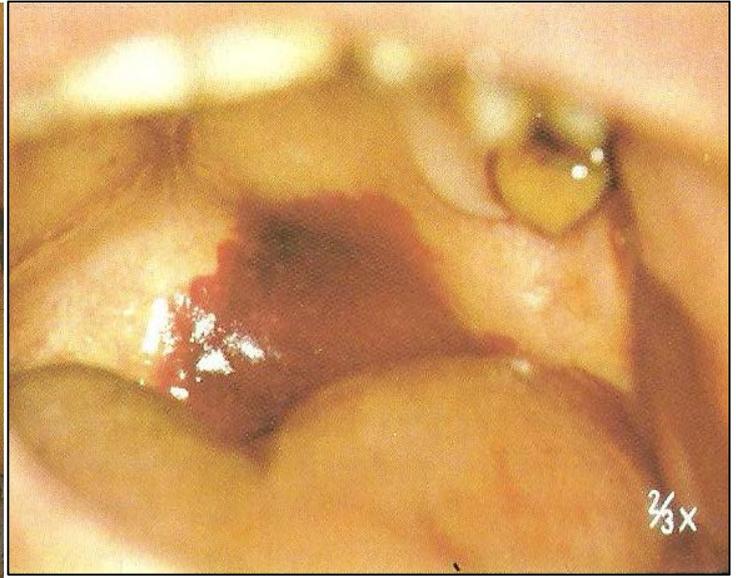
If the hematoma develops during a mental nerve block apply pressure over the mental foramen. The skin will discolor over the mental foramen and swelling will occur in the muco-buccal fold. If the hematoma occurs during a posterior superior alveolar nerve block, the

blood will diffuse into the infra-temporal fossa, and swelling will appear on the side of the face just after the injection is completed. The swelling occurs after a significant amount of blood has diffused, so direct pressure is often useless. Apply external ice.

The hematoma will disperse within 7 to 14 days with or without treatment. Avoid dental therapy in the area until the tissue is healed.



**Extensive haematoma following wisdom tooth extraction in a case of *thrombocytopeny***



**Haematoma of the soft palate following palatal injection.**

#### **4-Trismus**

Trismus is a motor disturbance of the trigeminal nerve and results in a spasm of the masticatory muscles causing difficulty in opening the mouth. Trismus can be caused by trauma to muscles or blood vessels in the infra-temporal fossa, injection of alcohol or sterilizing solution contaminated local anesthetic causing irritation to the tissues, hemorrhage, large volume of anesthetic solution deposited in one area,, or infection. If not treated, a chronic phase may develop leading to hypomobility, fibrosis, and scarring.

Use of disposable needles, antiseptic cleansing of the injection site, aseptic technique, and atraumatic injection technique will help prevent trismus.

Recommended treatment for trismus includes heat therapy with moist hot towels 20 minutes every hour, analgesics, and muscle relaxants if necessary. The patient should be instructed to exercise the area by opening, closing, and lateral excursions of the mandible for 5 minutes every 3 to 4 hours. The patient can chew sugarless gum to facilitate lateral movement of the TMJ.

If the pain continues over 48 hours, an infection may be present. Antibiotic therapy for 7 full days is indicated. If there is no improvement after 2 to 3 days without antibiotics or 7 to 10 days with antibiotics, refer the patient to an oral surgeon for evaluation.

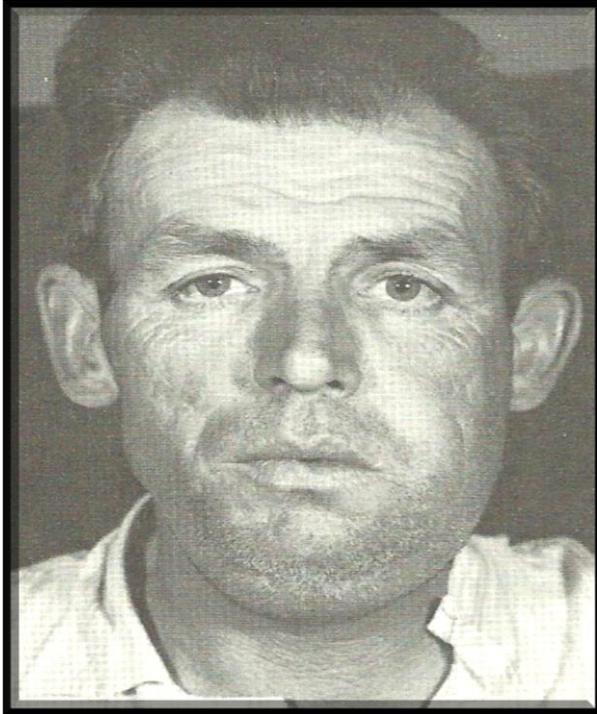
## **5-Infection**

Infection from a dental injection has become rare due to the use of sterile disposable needles and one-patient use cartridges. The needle will always be contaminated when it comes in contact with the patient's mucosa. Proper tissue preparation and sterile technique will virtually eliminate infection at the injection site.

The infection of a tissue space such as the *pterygo-mandibular space* may occur if an unsterile needle is used. If the injection is *superficial*, such as an infiltration into the palatal mucosa, then a localized abscess or ulcer may result.

When a *deep injection* is given, the consequences of infection may be serious or even fatal. It may produce a *toxaemia* which causes the patient to feel unwell, run a high pyrexia, and depending upon the site of injection, have other signs and symptoms such as *marked facial swelling*, *trismus*, *dysphagia* or difficulty in swallowing.

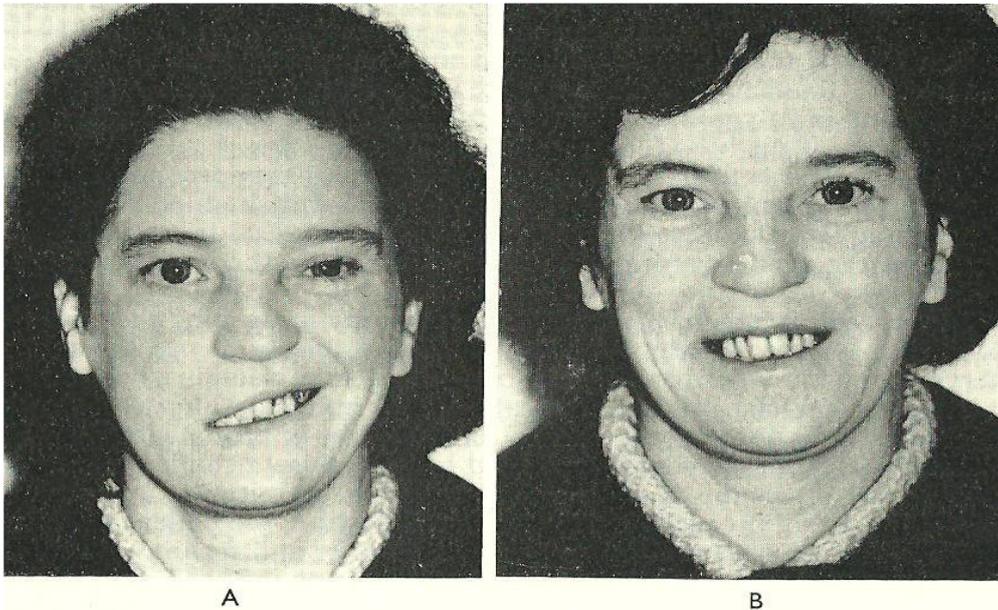
A cellulitis may result from spread of the infection in the tissue spaces surrounding the jaws. It is wise to refer such patients for specialist opinion of maxillofacial surgeons and for treatment.



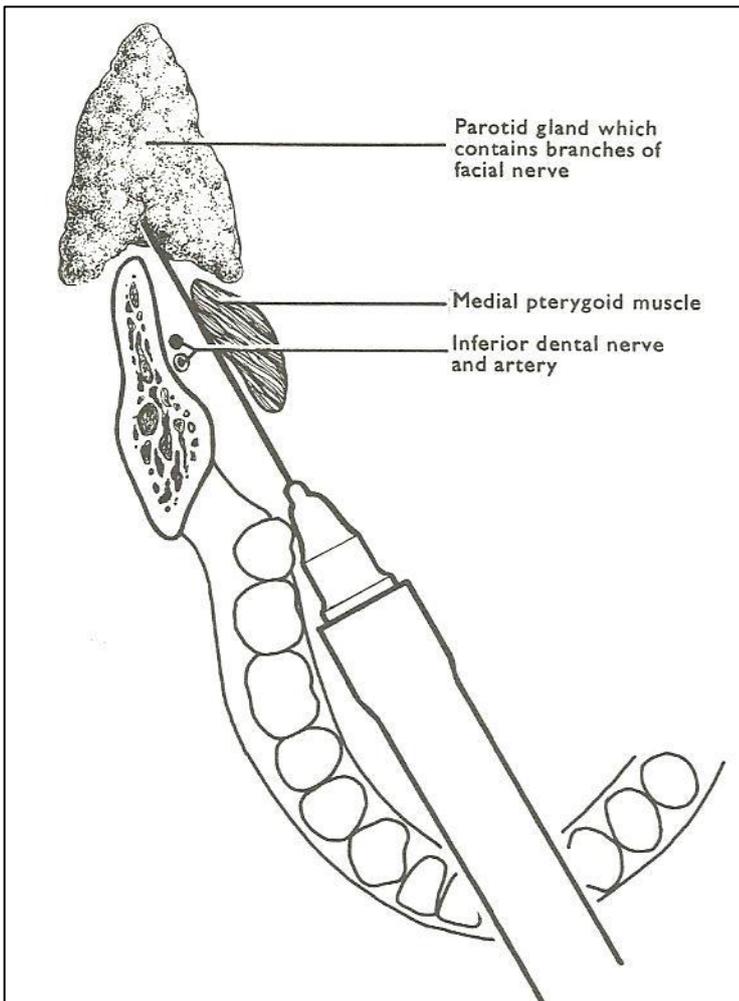
**Cellulitis involving the submandibular and sublingual spaces following an inferior alveolar nerve injection.**

## **6- Facial Nerve Paralysis**

If the local anesthesia is injected into the parotid gland, it will affect the facial nerve and the patient will notice facial drooping and will not be able to close their eye. If the needle is directed too posteriorly during an inferior alveolar nerve block or is over inserted during an Akinosi nerve block, the parotid gland may be anesthetized. Bone should be contacted before deposition of solution in the inferior alveolar nerve block to make sure the tip of the needle is not in the parotid gland. Inferior alveolar nerve anesthesia will not develop if the solution is in the parotid gland.



**A patient with a right facial palsy following an unsuccessful inferior alveolar injection. (A), attempts to smile produces only a unilateral effect due to paralysis of the facial muscles. (B), three hours later complete recovery has occurred.**



**Common mistakes with the inferior alveolar nerve injection. The angulation of the syringe is wrong because its barrel is over lying the incisors and not the premolars. Thus the needle has passed too far medially, missing the ascending ramus . The needle has then been inserted too deeply, and has entered the parotid gland.**

## 7- Broken Needles

When a needle breaks, remain calm. Instruct the patient to keep their mouth open, and if at all possible, place a biteblock. If an end of the needle is visible, retrieve it with a hemostat or cotton pliers. If it is not visible, do not try to retrieve it at this time. Explain to the patient what has happened. Send the patient to an oral surgeon for consultation. They may surgically remove the fragment or if the procedure will cause too much damage they may leave it where it is.

### Causes of breakage of needle:

1. Old needle
2. Needle which had been bent and then straightened out again.
3. Wrong needle.
4. Sudden movement of the patient.
5. Bad injection technique.

Smaller gauge needles are more likely to break than larger ones (size 25). Some practitioners habitually bend the needle and the metal is weakened in this area. A needle that breaks with part of it visible can be easily removed with a hemostat. Needles that break within the tissue may require removal by surgery.

## 8- Double and Blurred Vision

If the anesthetic solution is deposited too near *the inferior rectus muscle or the sympathetic innervation to the eye*, it can anesthetize the eye. *vascular spasm* or *accidental intra-arterial injection* is another likely cause.

This is a temporary condition and self-limiting. Patch the patient's eye until vision returns to normal.

## **B- General complications:**

1. Fainting (vaso-vagal attack).
2. Drug interactions.
3. Serum hepatitis.
4. Sensitivity reactions.
5. Occupational dermatitis.
6. Cardio-respiratory emergencies.