

Stellate Ganglion Block

Creates a sympathectomy of the upper extremity and the head.

INDICATION:

- Pain syndromes: CRPS, phantom limb pain, VZV infection
- Circulatory insufficiency: Frostbite, vaso-occlusive disease, Raynauds, Scleroderma

POSITION:

Patient lies supine with neck slightly extended

TECHNIQUE:

1. Ensure resuscitation equipment available, CAS monitors, IV access
2. Palpate Chassaignac tubercle between sternocleidomastoid and trachea at level of cricoid cartilage (C6)
3. Clean skin then raise a skin wheel between fingers over the tubercle
4. Insert a 22g 4cm short bevel needle with a 20cc syringe of local attached perpendicular to skin toward the tubercle.
5. When needle tip in contact withdraw 3mm and fix needle position.
6. After careful aspiration a 0.5mL test dose is injected, and with no neurologic symptoms, incremental doses of 8-12mL of 1% lidocaine or 0.25% bupivacaine are injected
7. Onset of sympathectomy indicates a successful block:
 - Horner's syndrome: ptosis, miosis, anhidrosis, nasal congestion

SIDE EFFECTS AND COMPLICATIONS:

7. Intravascular injection resulting in convulsions (vertebral artery or venous)
8. Pneumothorax
9. Epidural and subarachnoid injection
10. Block of the brachial plexus or recurrent laryngeal nerves
11. Hematoma formation

CONTRAINDICATIONS

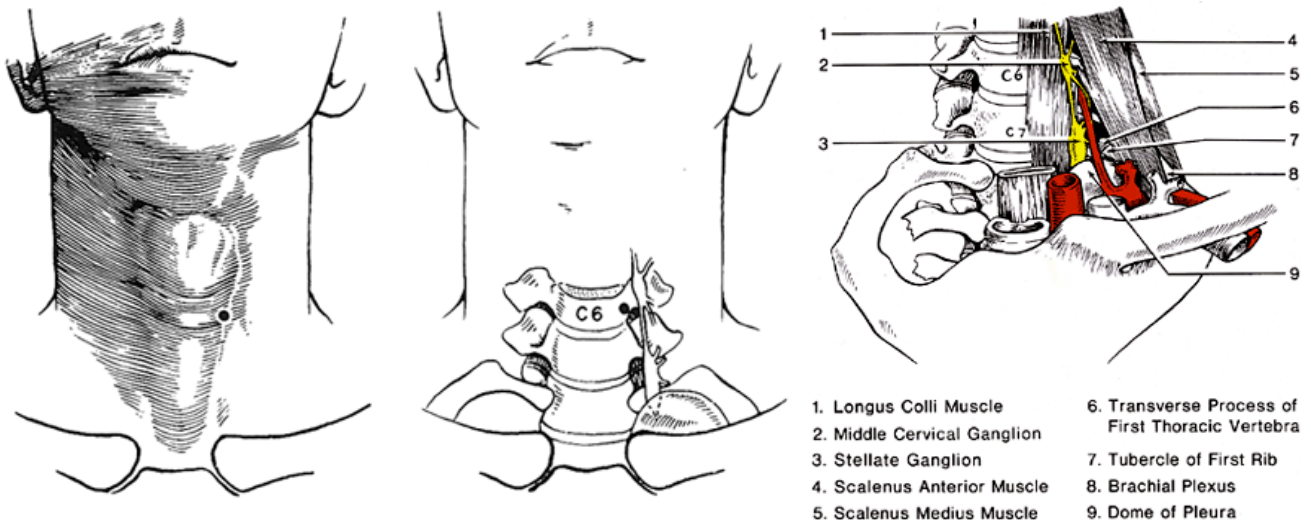
- Specific contraindications:
 - Contra-lateral recurrent laryngeal nerve injury
 - Respiratory cripple (possible phrenic nerve block)
- Infection at the site, coagulopathy, local anesthetic allergy, uncooperative patients, patient refusal, inadequate technical skill, lack of resuscitative equipment, pre-existing neuropathy is relative

DISTRIBUTION OF ANESTHESIA

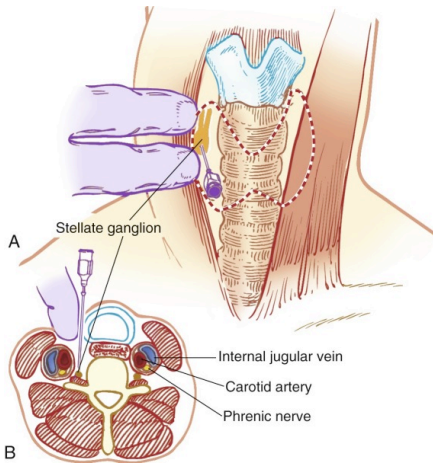
- All of the sympathetic nerves that supply the head and neck, and most of those that supply the upper limb, traverse the stellate ganglion
- Thus, blocking this structure will effect a temporary, sympathetic denervation of these areas
- Important to note that in a significant number of individuals an intrathoracic somatic branch arising from the second thoracic spinal nerve joins the first thoracic spinal nerve which, of course takes part in the formation of the brachial plexus
 - This intrathoracic branch is almost always joined by gray rami communicantes carrying postganglionic fibers that arise in the second thoracic sympathetic ganglion and possibly in the lower ganglia
 - These fibers join the lower part of the brachial plexus **without passing through the stellate ganglion**

Anatomy

- Sympathetic nerve fibers from T1-T6 supply the head, neck and upper extremities
 - As these fibers pass up the sympathetic chain, they form several ganglia
 - The stellate ganglion (SG) formed by the fusion of the first thoracic and inferior cervical ganglia
 - SG located anterior to the transverse process of C6 (Chassaignac's tubercle) and C7
 - Sympathetic chain lies along junction between anterolateral aspect of vertebral bodies & transverse process
 - Bounded posteriorly by fascia of the prevertebral muscles, anteriorly by carotid sheath (but SG is medial to artery); inferiorly by neck of first rib
 - Lower third of SG covered by pleura; at level of C7 vertebral artery lies lateral to SG, but at level of C6 vertebral artery moves posteriorly into the foramen intertransversarium



1. Longus Colli Muscle
2. Middle Cervical Ganglion
3. Stellate Ganglion
4. Scalenus Anterior Muscle
5. Scalenus Medius Muscle
6. Transverse Process of First Thoracic Vertebra
7. Tubercle of First Rib
8. Brachial Plexus
9. Dome of Pleura



- Patient should lie with head midline and slightly extended, on pillow, mouth slightly open; this stretches the esophagus out of the path of the needle
- When placing needle, parasthesias in the arm suggest that the needle is too lateral and has passed beyond the transverse process—readjust medially and more cephalad or caudad
- Successful Block
 - Horner’s syndrome (ptosis, miosis, anhidrosis, enophthalmos)
 - Ipsilateral nasal congestion
 - Flushing of conjunctiva and skin
 - ↑ temperature of involved extremity

Local Anesthetic

- **Bupivacaine 0.25% (without epinephrine)**
- **Lidocaine 1%**

COMPLICATIONS

Partial block

Infection

Needle

- Pneumothorax
- Esophageal injury
- Carotid artery / vertebral artery or IJ puncture (+/- injection of local anesthetic)
- Nerve Injury – do not inject if pain or high pressures are met, do not re-inject the deep nerves
- Hematoma – avoid multiple insertions

Local Anesthetic

- Intravascular injection – intermittent aspiration, 25g needle
- Temporary hoarseness and dysphagia (RLN block in 60%)
- Brachial plexus block
- Phrenic nerve block (ipsilateral diaphragm paralysis)
- Epidural or intrathecal block
- Bradycardia (block of cardioaccelerator nerves)
- Allergy / anaphylaxis

REFERENCES:

- Cousins—Neural Blockade
- Bonica – Sympathetic Nerve Blocks For Pain Diagnosis and Therapy
- Miller, Barash