Cervical Part of Sympathetic Trunks

Presented by: Dr. Sushma Tomar
Associate Professor
Department of Anatomy

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Introduction

- There are two sympathetic trunks (right & left) in human body.

Location-

- Each sympathetic trunk is paravertebral in position.
- Each sympathetic trunk extends from the base of skull to the first coccygeal vertebra (base of coccyx).
At the base of coccyx, both sympathetic trunks join to form **Ganglion Impar**.
**Sympathetic Trunks In The Neck**

**Location**
- Cervical part of sympathetic trunk lies in front of transverse processes of cervical vertebrae and neck of 1st rib.
- Each sympathetic trunk presents 3 ganglia in the cervical part:
  - Superior.
  - Middle.
  - Inferior.
Sometimes, inferior cervical and first thoracic sympathetic ganglion are fused to form a cervico-thoracic or stellate ganglion.
Initially the number of cervical sympathetic ganglia corresponds with the number of spinal nerves.

- Later, upper 4 cervical ganglia fuse to form superior cervical ganglion.

- 5\textsuperscript{th} & 6\textsuperscript{th} cervical ganglia fuse to form middle cervical ganglion.
CONNECTIONS OF SYMPATHETIC CHAIN IN NECK

Cervical sympathetic ganglia
(All branches are postganglionic)

- Somatic branches
  (Vasomotor, Sudomotor, Pilomotor)

- Visceral branches

- Vascular branches

On internal carotid artery for:
- Vasoconstriction of its branches
- Dilator of the pupil
- Levator palpebrae superioris

On external carotid artery for:
- Somatic to skin
- Visceral to glands

On inferior thyroid artery for:
- Visceral to lower larynx, trachea, hypopharynx, oesophagus

On vertebral artery for:
- Vasoconstriction of its branches only

Into skull via internal carotid artery

On external carotid artery

On inferior thyroid artery

On vertebral artery

Superior cardiac branch

Middle cardiac branch

Inferior cardiac branch

C1

C2

C3

C4

C5

C6

C7

C8
Cervical Part Of Sympathetic Trunk Contd...

- Cervical part of the trunk does not receive pre-ganglionic fibres through **white rami communicantes** from the cervical segments of the spinal cord.

- Each cervical sympathetic trunk gives post-ganglionic fibres via **grey rami communicantes** to each of the 8th cervical.
• All pre-ganglionic fibres for the cervical sympathetic trunk are derived from lateral horn cells of T1-T5 segments of spinal cord.

• These preganglionic fibres ascend through the trunk and finally relayed in 3 cervical sympathetic ganglia.
Superior Cervical Ganglion

- **Largest** of the cervical sympathetic ganglia.
- Formed by the fusion of **upper 4 cervical sympathetic ganglia**.

**SHAPE** - Fusiform (spindle).

**LENGTH** - ~2.5 cm.

**LOCATION** -
- In front of transverse processes of C2 & C3 vertebrae.
Superior Cervical Ganglion

- It receives pre-ganglionic fibres mostly from upper 3 thoracic segments of spinal cord.
Branches Of Superior Cervical Ganglion

- Divided into following groups:-
  - Lateral.
  - Medial.
  - Anterior.
  - Ascending.

- All branches convey post-ganglionic fibres and some sensory fibres from the target organs.
Lateral Branches Of Superior Cervical Ganglion

- These are grey rami communicans to upper 4 cervical nerves.
Medial Branches Of Superior Cervical Ganglion

- Laryngo-pharyngeal branches.
- Cardiac branch.

Laryngo-pharyngeal branches-
- Supply Carotid body.
- Form pharyngeal plexus with 9th & 10th nerves.

Cardiac branch-
- Right cardiac branch joins with the deep cardiac plexus.
- Left cardiac branch joins

\[ C_1N \text{ to } C_8N = 1\text{st to 8th cervical nerve in succession.} \]
Anterior Branches Of Superior Cervical Ganglion

- These ramify around common carotid aretry, external carotid artery and its branches.

- Sympathetic plexus around facial artery gives a filament to the submandibular ganglion.

- Sympathetic plexus around middle meningeal artery gives a filament to the otic ganglion and another filament to the genicular ganglion of facial nerve as external petrosal nerve.
INTERNAL CAROTID NERVE-

Branches of Sympathetic Plexus around Internal Carotid Artery-

- Carotido-tympanic nerves.
- Deep petrosal nerve.
- Nervus conarii- supply pineal gland.
- Communicating branches- to trigeminal ganglion, 3rd, 4th, 5th & 6th cranial nerves.
Middle Cervical Ganglion

- Formed by the fusion of 5th & 6th cervical sympathetic ganglia.

LOCATION:

- In front of transverse process of 6th cervical vertebra.
- Just above the loop of inferior thyroid artery.
COMMUNICATIONS-

- Connected with inferior cervical ganglion by ansa subclavia.

- Ansa subclavia loops in front and below the first part of subclavian artery.
Branches Of Middle Cervical Ganglion

- **Lateral.**
- **Medial.**

**Lateral branches** -
- These are grey rami communicans to 5\textsuperscript{th} & 6\textsuperscript{th} spinal nerves.

**Medial branches** -
- Thyroid branches.
- Cardiac branches.
Internal carotid artery

External carotid artery

Inferior thyroid artery

Cardiac branches from each ganglion

Vertebral artery

Ansa subclavia around subclavian artery
Inferior Cervical Ganglion

- Formed by the fusion of 7th & 8th cervical ganglia.

LOCATION-

- Between transverse process of C7 vertebra and neck of 1st rib.
Inferior Cervical Ganglion Contd...

- Sometimes this ganglion joins with the first thoracic sympathetic ganglion to form cervico-thoracic or stellate ganglion.
Branches Of Inferior Cervical Ganglion

- Grey rami communicans.
- Cardiac branches.
- Vascular branches.

Grey Rami Communicans-
- To C7 & C8 cervical spinal nerves.

Vascular Branches-
- Form plexuses around subclavian artery, 1st part of axillary artery and vertebral artery.
HORNER’S SYNDROME -
• A lesion affecting the pre-ganglionic fibres from T1 & T2 segments of spinal cord.

Clinical Features -
• Constriction of pupil (miosis).
• Drooping of upper eyelid (ptosis).
• Enophthalmos.
• Absence of sweating on affected half of face and head (anhydrosis).
• Loss of ciliospinal reflex.
Thank you