7 Nervous Tissue (AN 68.1,68.2,68.3)

Peripheral Nerve T.S. (Osmium Tetroxide)

Epineurium: It surrounds entire nerve and is made up of connective tissue.

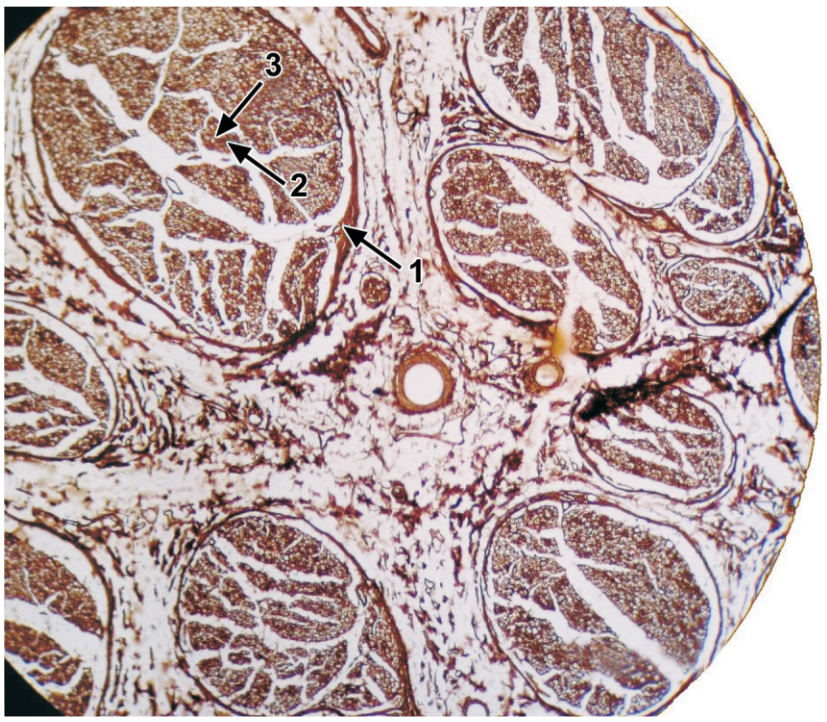
Perineurium: It surrounds bundles (fasciculi) of nerve fibres.

- It is a connective tissue sheath made up of two to three layers of flattened cells and covered externally by basal lamina.

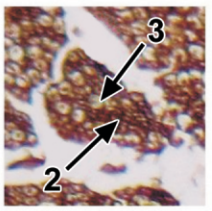
Endoneurium: It surrounds individual nerve fibre and made up of thin layer of connective tissue.

- These connective tissue sheaths carry blood vessels which supply the nerve fibres.

Myelin sheath: Surrounding each axon takes up of osmium stain and appears dark in colour.



1. Perineurium
2. Axon surrounded by endoneurium
3. Myelin sheath around the axon



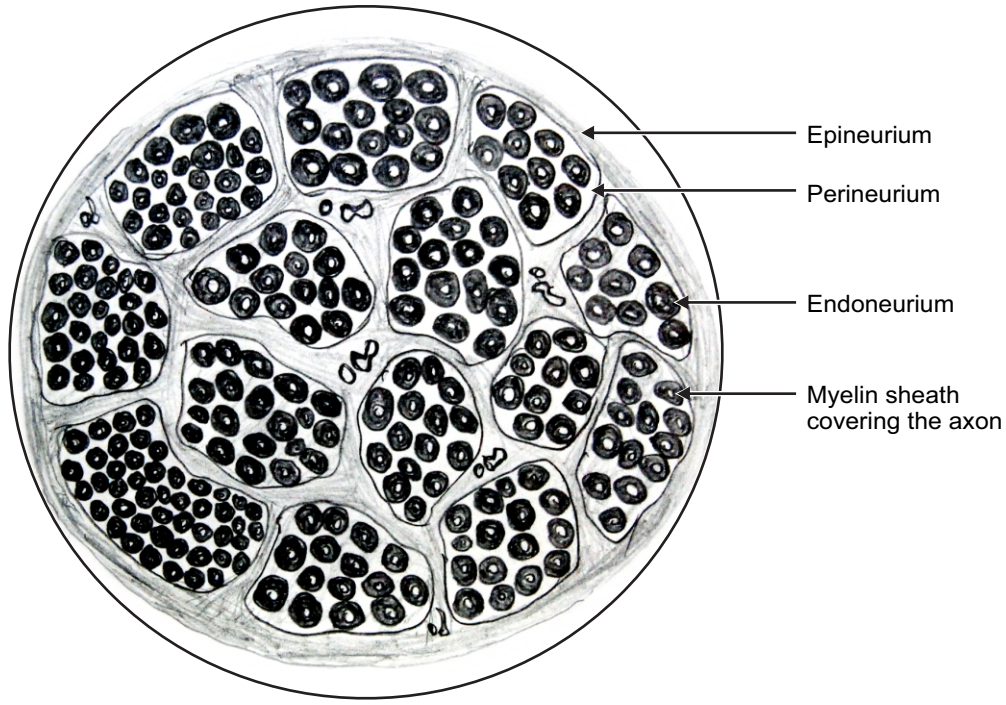
Key Features to Identify the Slide

[Osmic acid stain]

- Transversely cut nerve fibres arranged in bundles
- Epineurium covering the whole nerve
- Perineurium covering the bundles of nerve fibres
- Endoneurium covering each nerve fibre

Examples

- Radial nerve
- Sciatic nerve

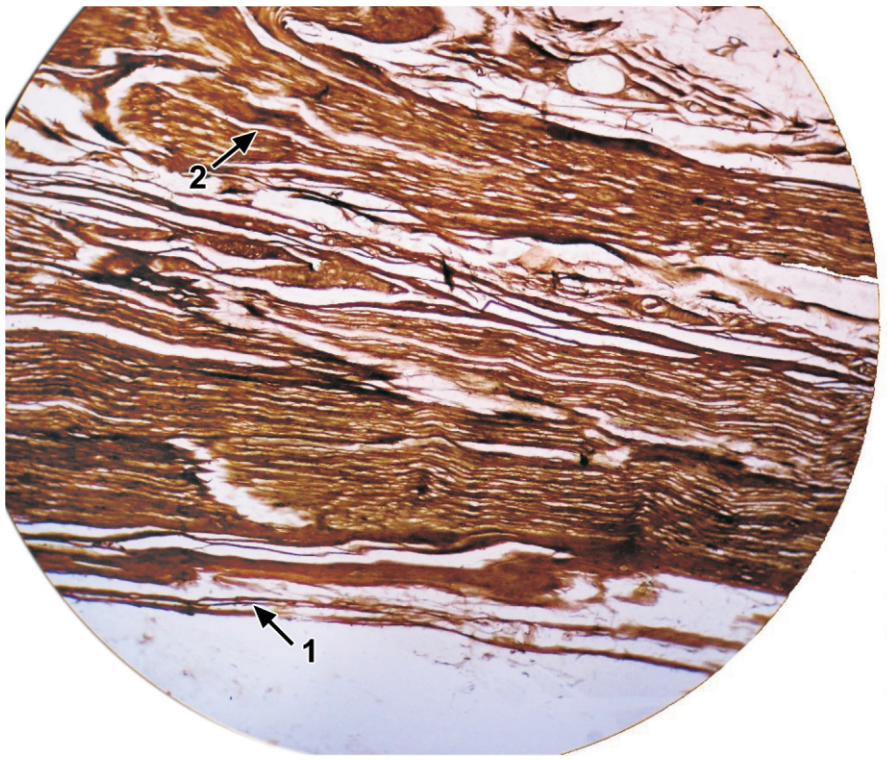

Epineurium
Perineurium
Endoneurium
Myelin sheath
covering the axon

Peripheral Nerve L.S. (Osmium Tetroxide)

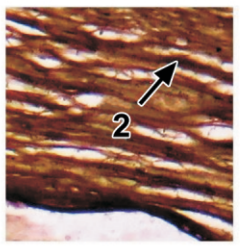
Each axon/peripheral nerve has axolemma (cell membrane) which surrounds the cytoplasm (axoplasm).

- Outside axolemma there is presence of myelin sheath which is synthesized by Schwann cell.
- Cytoplasm and nucleus of Schwann cell give rise to neurilemmal sheath.
- Outside the neurilemmal sheath is the innermost connective tissue layer of nerve that is endoneurium.

Node of Ranvier: The gap between two segments of myelin sheath or interval between two Schwann cells which helps in faster conduction of impulses.



1. Perineurium
2. Myelin sheath around the axon



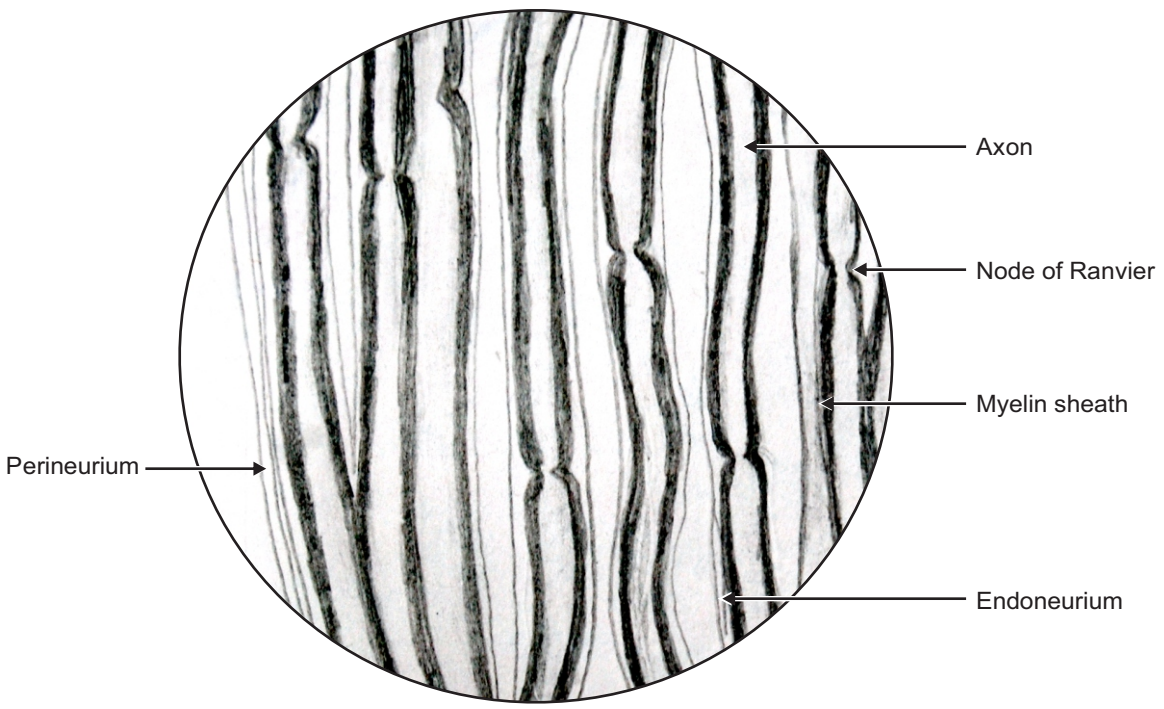
Key Features to Identify the Slide

[Osmic acid stain]

- Long and vertically arranged nerve fibres
- Centrally placed axon
- Myelin sheath with nodes of Ranvier

Examples

- Radial nerve
- Sciatic nerve


Axon
Node of Ranvier
Myelin sheath
Perineurium
Endoneurium

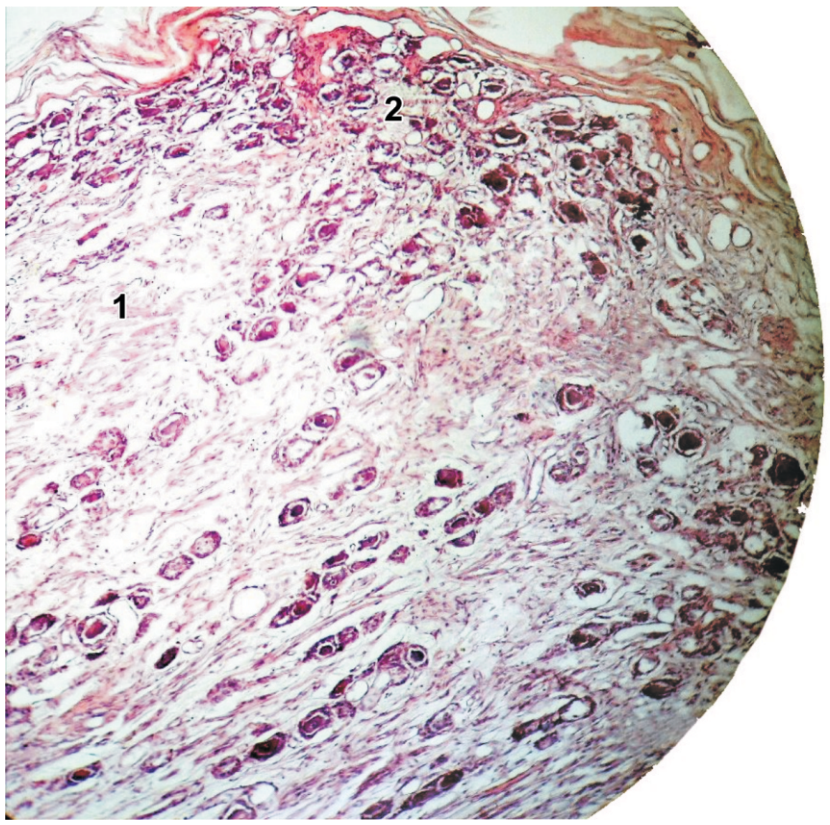
SENSORY (SPINAL) GANGLION

Ganglion: Collection of nerve cell bodies outside the central nervous system.

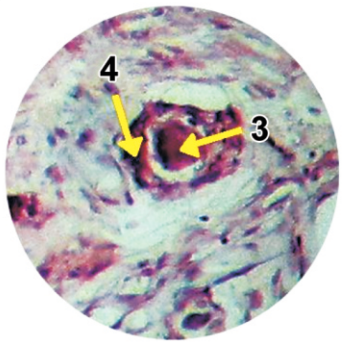
- Ganglion is covered by connective tissue capsule.
- Groups of pseudounipolar neurons being separated by bundles of myelinated nerve fibres.
- Cell bodies of pseudounipolar neurons have prominent nucleus and nucleolus.

Satellite cells: Present around the cell bodies.

- Provide structural support and nourishment to it.



1. Bundles of nerve fibres
2. Unipolar neurons in groups
3. Prominent nucleus and nucleolus
4. Satellite cell

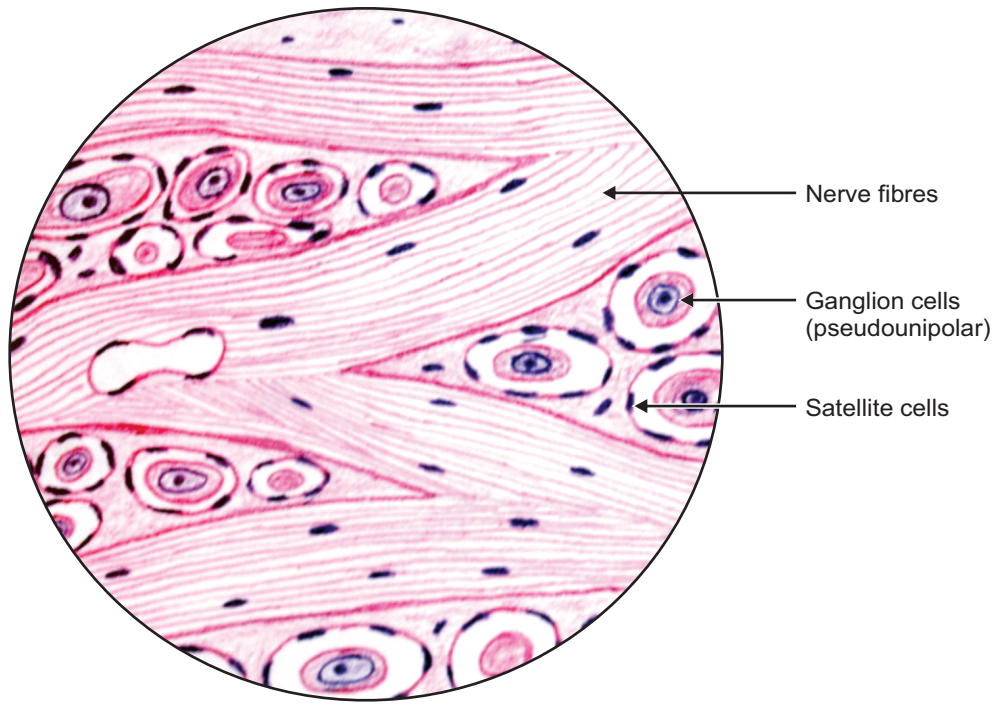


Key Features to Identify the Slide

- Presence of pseudounipolar neurons arranged in groups
- Centrally-placed nucleus
- Well-arranged satellite cells

Example

– Dorsal root ganglion/ spinal ganglion

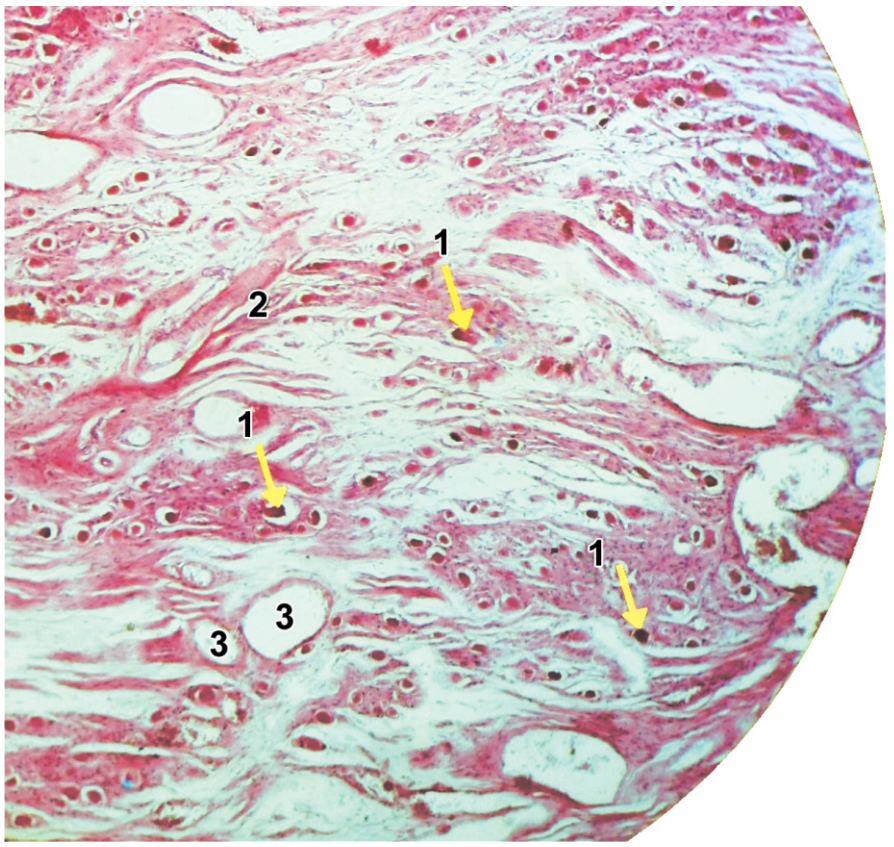

Nerve fibres
Ganglion cells
(pseudounipolar)
Satellite cells

AUTONOMIC (SYMPATHETIC) GANGLION

- Presence of numerous blood vessels in between the scattered cell bodies of multipolar neurons.
- Bundles of myelinated and non-myelinated nerve fibres run in between the nerve cell bodies.
- Thin connective tissue capsule is seen with very few satellite cells.

Applied Aspects of Nervous Tissue

1. Guillain-Barresyndrome—immune mediated disease of peripheral nervous system leading to demyelination of nerve fibres.
2. Schwannoma—benign tumor of Schwann cells (also termed as neuroma).



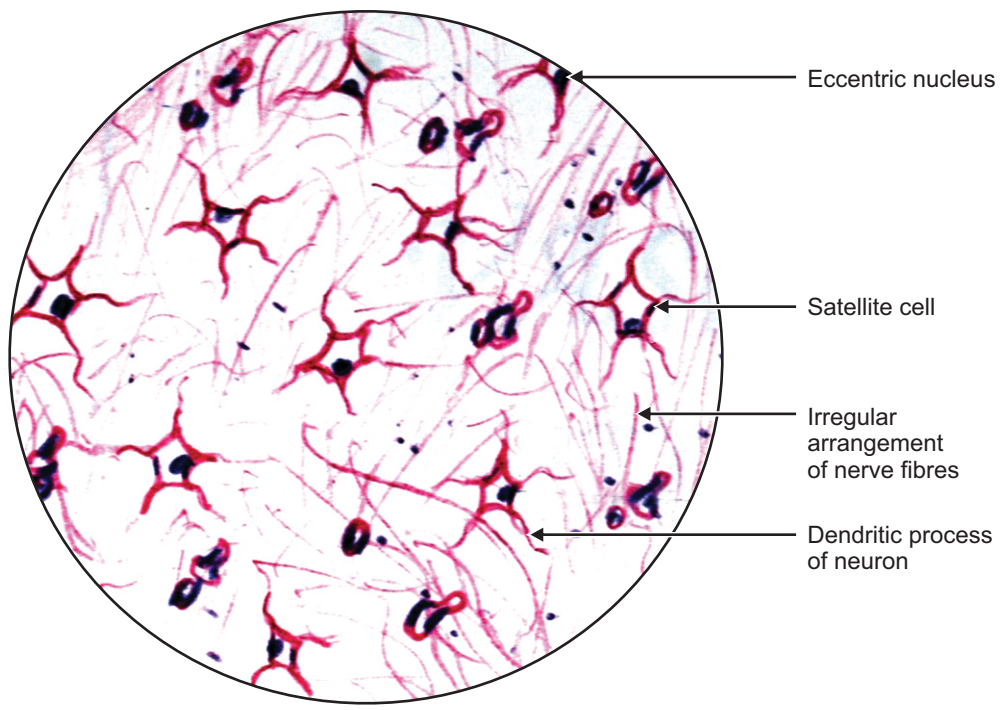
1. Multipolar neurons scattered
2. Bundles of nerve fibres
3. Blood vessels

Key Features to Identify the Slide

- Presence of scattered multipolar neurons
- Eccentrically placed nucleus
- Satellite cells are poorly defined

Example

– Superior cervical sympathetic ganglion


Eccentric nucleus
Satellite cell
Irregular arrangement of nerve fibres
Dendritic process of neuron