The second cervical dorsal nerve roots contain afferent somatic and visceral nerve fibers corresponding to the second cervical spinal cord segment. They are short but thicker than the second ventral nerve roots and emerge from the postero-lateral sulci of the spinal cord. Rootlets of adjacent dorsal roots may communicate via thin branches.

The dorsal roots pass almost horizontally to their exit through the intervertebral foramina. They pass over the superior surface of the transverse processes of C2 (axis) posterior to the foramen transversarium, to join with the second cervical ventral roots to form the second cervical spinal nerves. Each of the second cervical dorsal roots possesses an ovoid spinal ganglion (dorsal root ganglion) proximal to joining the second cervical ventral roots.

The dorsal roots are covered by a sleeve of pia mater, which is continuous with that of the spinal cord, and loosely invested by a prolongation of dura and arachnoid mater (the dural sleeve) almost as far as the spinal nerves.