Neurulation

The neural plate is a key developmental structure that serves as the basis for the nervous system.

Opposite the primitive streak in the embryo, ectodermal tissue thickens and flattens to become the neural plate. The region anterior to the primitive knot can be generally referred to as the neural plate. Cells take on a columnar appearance in the process as they continue to lengthen and narrow. The ends of the neural plate, known as the neural folds, push the ends of the plate up and together, folding into the neural tube, a structure critical to brain and spinal cord development. This process as a whole is termed primary neurulation.

Formation of the caudal spinal cord in vertebrates is by secondary neurulation, which begins with mesenchyme-epithelium transformation within a pluripotential blastema called the tail bud or caudal cell mass, from thence initiating an event sequence proceeding from the condensation of mesenchyme into a solid medullary cord, intrachordal lumen formation, to eventual partial degeneration of the cavitatory medullary cord until, in human and tailless mammals, only the conus and filum remain [1].

<html><iframe width="560" height="315" src="https://www.youtube.com/embed/lGLexQR9xGs" frameborder="0" allowfullscreen></iframe></html>

Uncommon secondary neurulation malformations:

Retained medullary cord, Terminal myelocystocele, and unjointed primary and secondary neural tubes

1)
Pang D, Zovickian J, Moes GS. Retained medullary cord in humans: late arrest of secondary neurulation. Neurosurgery. 2011 Jun;68(6):1500-19; discussion 1519. doi: 10.1227/NEU.0b013e31820ee282. PubMed PMID: 21336222.