Sacrum is a wedge-shaped bone located between the two iliac bones at the sacroiliac joint, forming the posterior wall of the pelvis. Normally, there are five sacral vertebrae between the cranial end, the fifth lumbar vertebra, and the caudal end, the first coccygeal vertebra, which generate four pairs of sacral foramina. However, in the sacrum under study, the fifth pair of sacral foramina was developed due to sacralization of the first coccyx with the fifth sacral vertebra. This resulted in the formation of an additional fifth pair of sacral foramina.

Ventral surface exhibited no unusual feature except that instead of four pairs of sacral foramina, there were five pairs. The variant is of paramount importance to surgeons and obstetricians dealing with these nerves.
gene is responsible for patterning of shapes of vertebra [4]. So probably mutation in this gene could lead to sacralization of coccygeal vertebra. Exact cause is not known although genetics may play an important role. Less common reasons could be traumatic injury, extreme arthritic changes and purposeful spinal fusion surgery.

Normally fifth sacral nerve and coccygeal nerve pass through sacral hiatus. With the formation of fifth pair of sacral foramina above mentioned structures pass through fifth pair of sacral foramina.

Clinical Significance

The sacrum is clinically important for caudal epidural block which is performed for the diagnosis and treatment of lumbar spine disorders [5]. Caudal anesthesia is given in different surgical procedures like hernia repairs, lower limb surgery, surgery below umbilicus, etc. In this procedure, sacral cornua are identified. However, in case of sacralization of coccygeal vertebra, it will be difficult to mark the landmark and this may lead to caudal block failure. In addition to it, this route is also used for giving postoperative analgesia in children. Due to this variant there may be insufficient analgesia.

Normally coccyx is mobile and during second stage of labor it is pushed backwards, thus increasing the antero-posterior diameter of pelvic outlet, which facilitates delivery. Due to fusion, coccyx becomes fixed and there is no increase in antero-posterior diameter of pelvic outlet. This may lead to prolonged second stage of labor and perineal tears.

Thus clinically, the sacralization of coccygeal vertebra is of paramount importance to surgeons especially pediatric surgeons and obstetricians.

References