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Contents

Editorial

- ▶ DNA Sequencing: From Medicine to Personalized Medicine 5-7
Dr. DM Arifur Rahman, Dr. Fahim Uddin Ahmad, Dr. Md. Matiur Rahman

Original Article

- ▶ Comparison of Serum Uric Acid Concentrations in Patients with Lichen Planus and other Dermatoses 9-15
Dr. Farah Safa Huq, Dr. Mohammed Saiful Islam Bhuiyan, Dr. Emily Akter, Dr. Khyrun Nahar Shaila
- ▶ COVID-19 and Online Medical Education Perspective; A Study in TMSS Medical College 17-23
Dr. Mst. Nadira Parvin, Dr. Md. Matiur Rahman, Professor Dr. Md. Anup Rahman Chowdhury
- ▶ Assessment of Clinical Characteristics and FNAC Findings of Different Thyroid Lesions in a group of Bangladeshi patients 25-29
Dr. Mehdi Ashik Chowdhury, Dr. DM Arifur Rahman, Dr. A K M Maruf Raza, Dr. Syeda Noorjahan Karim, Dr. Md. Neaz Nowsher, Dr. Zerin Shabnam Rahman, Dr. Mohammad Mahabubul Hoque
- ▶ Efficacy of Mineral Trioxide Aggregate and Calcium Hydroxide as Root Canal Sealer in Non-vital Permanent Tooth 31-37
Dr. Mst. Dilruba Khatun, Dr. Evan-E-Alam Emtakamul Haque, Dr. Musfiqa Aman, Dr. Mostofa Mohammad Ekramul Hasan, Dr. Md. Rakibul Hassan Khan, Professor Dr. Md. Shamsul Alam
- ▶ Clinical Profile of 306 Patients with Chronic Low Back Pain in a Tertiary Care Hospital 39-42
Dr. Ferdousur Rahman Al-Mahmud, Dr. Muhammad Alamgir Mandal, Dr. Mst. Shamina Khatun, Dr. Mohammad Azizur Rahman

Case Report

- ▶ Benign intra-renal lipoma in two years old girl 43-45
Dr. Md. Mofazzal Sharif, Dr. DM Arifur Rahman
- ▶ Sigmoid mesocolon cyst : Case report 46-48
Professor Dr. Md. Rezaul Islam, Dr. A.H.M Shahnewaz Shoubho
- ▶ Abnormal Extension of Sacral Hiatus- A Case Report 49-51
Dr. Rawshon Ara Naznin, Dr. Md. Moniruzzaman, Dr. Afsana Khanam, Dr. Maskura Benzir, Dr. Taslima Akter



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Case Report**Abnormal Extension of Sacral Hiatus- A Case Report**Naznin RA^{1*}, Moniruzzaman M², Khanam A³, Benzir M⁴, Akter T⁵

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Corresponding Author*Abstract**

Sacral hiatus is the gap on the lower part of dorsal surface of sacrum. It is formed due to fail to fuse of the lamina of the 5th sacral vertebrae. During research work regarding sacral morphometry, in the department of Anatomy, Sylhet MAG Osmani Medical College, Sylhet, Bangladesh, it was observed that a dry adult human sacrum with abnormal extension of sacral hiatus where apex of sacral hiatus was present at the level of second sacral vertebra. As far abnormal extension up-to second sacral vertebra has not been described in Bangladesh. Such type of variation has paramount importance in clinical field to avoid complication related to caudal epidural block or other spinal surgeries and for some important diagnosis such as low back pain, sciatica etc.

Key words: Sacrum, Sacral hiatus, Caudal epidural block.

Introduction

The sacral canal is a continuation of the vertebral canal that terminates as the sacral hiatus¹. The sacral canal contains the anterior and posterior roots of the lumbar, sacral and coccygeal spinal nerves, the filum terminale and fibrofatty material. It also contains the lower part of the subarachnoid space down as far as the lower border of the second sacral vertebra. The lower sacral spinal roots and filum terminale pierce the arachnoid and dura mater at that level. The laminae of the fifth sacral vertebra and sometimes those of the fourth fail to meet in the midline forming the sacral hiatus². Standard textbooks mentions the sacral hiatus is arch shaped and somewhat triangular outline when seen from the dorsal aspect³. On either side of the sacral hiatus are bony projections called the sacral cornua⁴. These can easily be palpated by the finger immediately above the natal cleft⁵. The filum terminale with its meningeal coverings emerges below the sacral hiatus and passes downwards across the dorsal surface of the fifth sacral vertebra. The fifth sacral spinal nerves also emerge through the hiatus medial to the sacral cornua and lateral aspects of the fifth sacral vertebra¹. Considerable variability in the anatomy of sacral hiatus exists between individuals, races and stature. The sacral hiatus may be closed, asymmetrically open

or widely open. As age advances the overlying ligaments and the cornua thicken. Consequently the identification the hiatal margins become challenging¹. Injection of a drug into the epidural space through the sacral hiatus is involved in caudal epidural block for providing anaesthesia and analgesia in various clinical settings. So knowing the anatomical relations of the sacral hiatus will facilitate the procedure⁶. There is no known study regarding abnormal extension of sacral hiatus is found in Bangladesh. In this case apex of sacral hiatus situated at the level of second sacral vertebra.

Case Report

This case of abnormal extension of sacral hiatus was observed during research work regarding sacral morphometry in the department of Anatomy, Sylhet MAG Osmani Medical College, Sylhet, Bangladesh. We observed that a dry adult human sacrum with abnormal extension of sacral hiatus where apex of sacrum was present at the level of lower border of second sacral vertebra. For improve awareness about the variation due to developmental anomaly of sacral hiatus has been discussed in this paper.



Figure-1 Photograph showing sacral hiatus in the dorsal wall which is formed due to failure of fusion of laminae of fifth sacral vertebra.



Figure-2 Photograph showing the unnatural extension of sacral hiatus to a level just inferior to the spinous process of second sacral vertebra.

Discussion

Various study suggest that the success of caudal epidural anaesthesia depends on anatomical variations of sacral hiatus. Ultrasonography or fluoroscopy is 100% successful in caudal epidural block but it is not always possible due to time, cost and personal availability. Knowledge of this unusual extension of sacral hiatus may be helpful to the radiologists in interpreting the radiographs of sacral spine^{7, 8}. Orthopaedicians and neurosurgeons and other clinicians must also be aware of the extension of sacral hiatus during treating a case of involvement of lower back, urinary bladder or rectum analcanal.

Commonly apex of the sacral hiatus was observed at the level of 4th sacral vertebra containing 5th pair of sacral and a pair of coccygeal nerve root, filum terminale externa and fibro fatty tissue. In abnormal extension of sacral hiatus as observed in this case it may contain 3rd, 4th pair of sacral nerve also. In that case these nerve roots are abnormally exposed and are liable to be damaged due to lack of knowledge. Patil et al., (2012) suggested that there are chances that the drug injected for caudal epidural block may enter the subarachnoid space if dural sac and subarachnoid space are extending till the level of third sacral vertebra⁹.

Though such case are not reported in Bangladesh before, in Delhi Khanna and Chauhan (2013) found a sacrum where sacral hiatus was extended to a level just inferior to the spinus process of second sacral vertebra⁷, like the present case. Galkwad et al, (2019) reported that complete agenesis of dorsal wall of the sacral canal in Bhubaneswar India⁸. The developmental explanation and clinical significance of this abnormalities still remain contentious. So further study is recommended for better knowledge regarding hiatal abnormalities.

Conclusion

For improve awareness about variation due to developmental anomaly of sacral hiatus to avoid complications related to caudal epidural anesthesia in the field of surgical practices and post-operative analgesia in children.

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