

Pathology of epidermoid cyst in the spinal cord of swiss albino mice

M.C. Prasad*, M.G. Brahmkar, U.M. Kapurkar, A.Adak, P.S. Lonkar, M.V. Patel, Vishal Pavitrakar, Sanjay Bokan and Sharad Sharma

Pathology Section, Department of Toxicology, Jai Research Foundation, Vapi- 396195, Gujarat, India

Received: 17.7.12; Accepted: 14.11.12

ABSTRACT

Prasad, M.C., Brahmkar, M.G., Kapurkar, U.M., Adak, A., Lonkar, P.S., Patel, M.V., Pavitrakar, Vishal, Bokan, Sanjay and Sharma, Sharad (2012). Pathology of epidermoid cyst in the spinal cord of swiss albino mice. Indian J. Vet. Pathol., 36(2) : 247-248.

Two cases of epidermoid cyst were recorded one each in male and female Swiss albino mice (3-4 months) out of about 2000 mice used in various toxicity studies. These were located in the white matter of lumber segment of spinal cord. No clinical sign during life phase and gross lesion on necropsy were recorded. Histopathological features consisted of multilayered stratified squamous epithelial cystic wall having either keratinaceous debris or concentric laminated layers of keratin in the lumen. It was considered to be an incidental finding of congenital origin.

Keywords: Epidermoid cyst, histopathology, mice, spinal cord.

Epidermoid/dermoid cyst, though a rare congenital anomaly of nervous system (brain and spinal cord), has been reported in a number of laboratory species like rat, mouse and dog¹⁻⁵, lamb⁶ and horse⁷. Kulwich⁴ citing his own observations and the works of different workers opined that epidermoid cysts are more commonly seen in mice than rats and the lesions more frequently occur in spinal cord than brain. However, keeping in view the paucity of published information on epidermoid cyst in the spinal cord and central nervous system of mice in Indian literature, two cases of spinal epidermoid cysts are put on record in the present communication.

Spinal cords of about 2000 (2.5 to 18.0 months) Swiss albino mice of either sex, equal in number, used in

different repeated dose toxicity studies (28 days and above), sacrificed at termination, moribund state and found dead formed the materials for this investigation. The subjects in the present study were two (2/2000, 0.1%) mice, one each in male and female, aged about 3-4 months belonging to a 28 days toxicity study.

Stroop⁸ observed cysts in lumbar/sacral region in different strains of mice and the rate of occurrence ranged between 3.7 (2/54) to 6.3 (5/79) per cent and has been considered to be an incidental lesion⁹. No clinical sign was expressed by these mice during life phase and on necropsy too none of the three segments (cervical, thoracic and lumbar) of spinal cord and brain revealed any gross

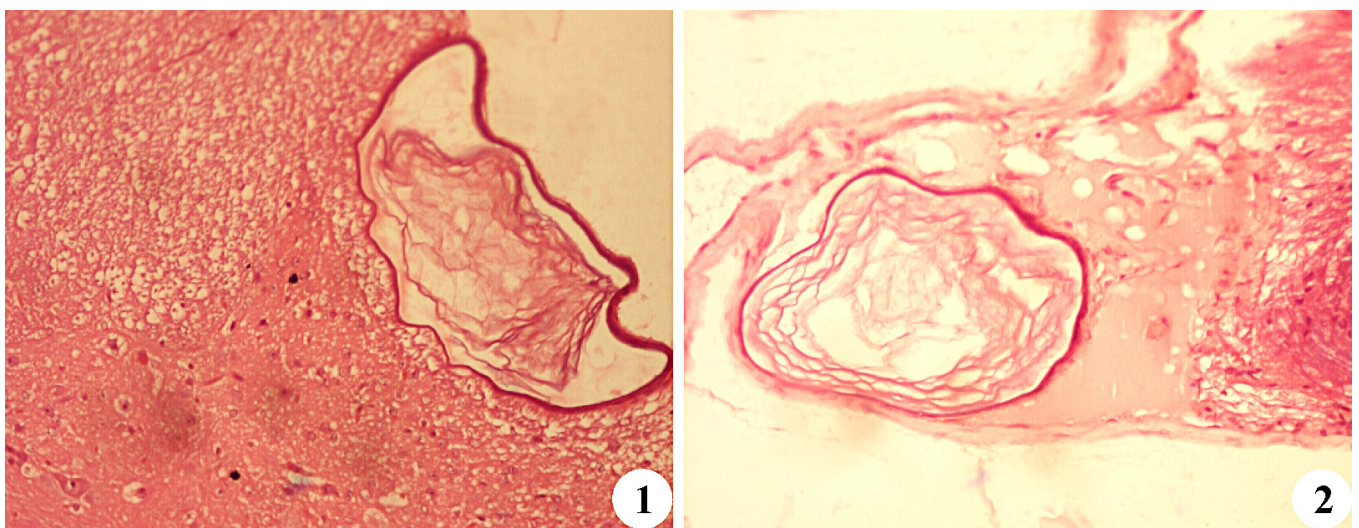


Fig. 1. Irregularly oval epidermoid cyst embedded in white matter and lined by stratified squamous epithelium containing desquamated keratin in lumen. H&E x100; **Fig. 2.** Irregularly oval epidermoid cyst embedded in white matter and lined by stratified squamous epithelium containing concentric layers of desquamated keratin in lumen. H&E x100.

*Corresponding author: email: pathology@jrffonline.com

lesion of significance. Along with other morbid tissues, all the three segments of the spinal cord were fixed 10 % neutral buffered formalin and processed routinely to have H&E. stained microsection (5 microns) for histopathological interpretation. In both the mice the epidermoid cysts were peripherally located in the white matter of lumber portion of spinal cord. No such cyst could be seen in cervical and thoracic segments of spinal cord and brain and supported the views of earlier workers that it usually occurs in white matter of spinal cord¹⁰. The histomorphology of the cyst was characterized by an irregular contour with almost an oval shape. Hardly any compression could be seen on surrounding spinal parenchyma. Stratified squamous epithelium varying in thickness from two to five cell layers formed the wall of the cyst. The lumina were filled either with keratinaceous debris (Fig.1) or concentric laminated layers of keratin (Fig.2) without any inflammatory reaction around. At times breach in cystic wall and leakage of cystic contents in surrounding provoke inflammatory reactions. The histomorphological features of the present cases compared well with those reported by earlier workers both in mice and rats^{4,5,9,10}. The histogenesis of epidermoid cyst in nervous system is considered to be due to the misplacement of surface ectoderm during closure of neural tube¹¹.

ACKNOWLEDGEMENTS

Authors are thankful to the Management of Jai Research Foundation, Vapi and Lupin, pharmaceuticals, Pune for extending the facilities and grant of permission to publish the findings.

REFERENCES

1. Levine S. 1966. Epidermoid cysts of the spinal cord: a spontaneous disease of rats. *J. Neuropathol. Exp. Neurol.*, **25**: 498-504.
2. Nobel TA, Nyska A, Pirak M, Skolnik M and Meshorer A. 1987. Epidermoid cysts in the central nervous system of mice. *J. Comp. Pathol.*, **97**: 357-9.
3. Sugimoto T, Misawa Y and Niki R. 1994. An intracranial epidermal cyst in a Sprague-Dawley rat. *J. Vet. Med. Sci.*, **56**: 577-579.
4. Kulwich BA. 1994. Epidermoid cysts in the central nervous system of rats and mice: an incidental finding in toxicity/ oncogenicity studies. *Vet. Pathol.*, **31**: 475-478.
5. Satoh H and Furuhashi K. 2001. "Have You Seen This?" An Epidermoid Cyst with Rosette-Like Structures of the Cerebrum in a Male BALB/c Mouse. *Toxicol. Pathol.*, **29**: 498.
6. Baharsefat M, Amjadi AR, Yamini B and Ahourai P. 1972. Epidermal cyst in the spinal cord of a lamb. *Vet. Rec.*, **91**: 36-38.
7. Kelly DF and Watson WJ. 1976. Epidermoid cyst of the brain in the horse. *Eq. Vet. J.*, **8**: 110-112.
8. Stroop WG. 1984. Spinal leptomeningeal epidermoid cysts in inbred mouse strains. *Acta Neuropathol.*, **63**: 301-305.
9. Radovsky A and Mahler JF. 1999. *Nervous system in pathology of mouse- reference and atlas*. Eds, Maronpot, RR, Boorman, GA and Gaul, BW. Cache river press, 2850, Oak Grove Road, Vienna, II, 62955, USA. Pp-445-470.
10. Mitsumori K and Boorman GA. 1999. *A spinal cord and peripheral nerves in pathology of the Fisher rat- reference and atlas*. Eds by Boorman GA, Eutis SL, Elwell MR, Montgomery CA, Mackenzie WF (eds). Academic Press/Inc. Harcourt Brace Jovavovich Publishers San Diego New York Boston London Sadney Tokoyo, Toronto, pp 179-192.
11. Grant Maxie M and Youssef S. 2007. Chapter 3. Nervous system In: *Jubb, Kennedy and Palmer's Pathology of Domestic Animals*. Ed/Grant Maxie, M, Vol. 1. 5th edn., pp. 287-9, 291, 292, 294-5, 454. Saunders Elsevier, Philadelphia, PA.