Intranuclear Inclusion Bodies in the Epithelium of the Human Vas Deferens

M Chen, B Wang

Citation

M Chen, B Wang. *Intranuclear Inclusion Bodies in the Epithelium of the Human Vas Deferens*. The Internet Journal of Pathology. 2006 Volume 6 Number 2.

Abstract

Prominent intranuclear inclusion bodies in epithelial cells of the human vas deferens are common. Four different types of such inclusion bodies have been identified by electron microscopic studies in fertile males. Certain types of these inclusion bodies stain positive for PAS. Although the origin and functional significance of these intranuclear inclusion bodies are not very well known, they should not be interpreted as pathologic changes of the vas deferens epithelium.

CASE REPORT

A 39-year-old Caucasian male sought for sterilization and underwent vasectomy in the hospital. Past medical history was noncontributory.

Two segments of excised vas deferens (left and right), measuring approximately 2.0 cm each in length, were grossly normal. Microscopically, both segments showed complete cross-section. The lumens were lined by psedostratified, columnar epithelium. The epithelial cells stained uniformly with hematoxylin and eosin, with the exception of intranuclear inclusion bodies appearing in a certain population of columnar cells. These intranuclear inclusion bodies were spheroidal, homogeneous and devoid of any internal structure. They varied in size from 0.3 µm to 2.0 µm in diameter (Figure 1). Further studies revealed that some of these intranuclear inclusion bodies were positive for Periodic Acid Schiff (PAS) stain (Figure 2). The stromal loose connective tissue beneath the epithelium and the outer muscular wall showed no histopathologic abnormalities.

WHAT IS YOUR DIAGNOSIS?

Pathologic Diagnosis: Complete cross-section of bilateral vas deferens, with no significant histopathologic abnormalities.

Figure 1

Figure 1: The epithelium of the vas deferens contains intranuclear inclusion bodies of variable sizes (H&E, original magnification 400).

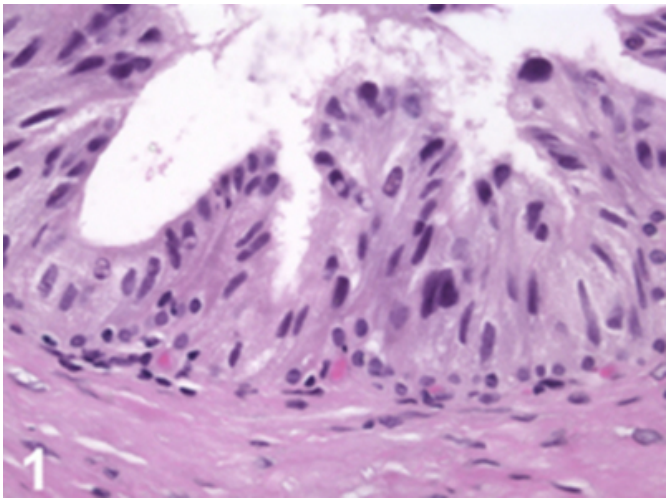
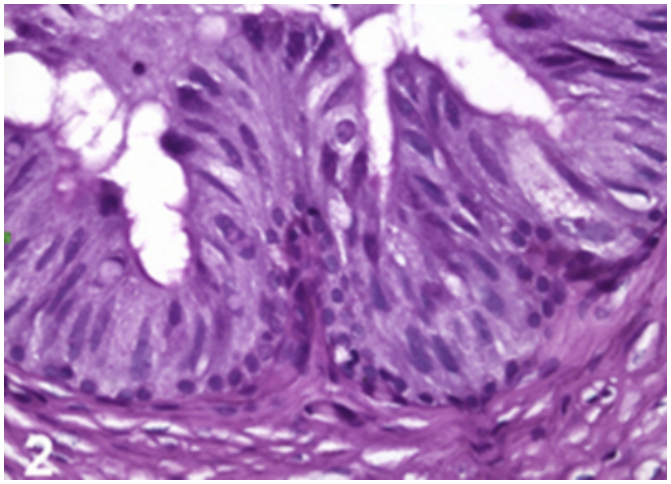


Figure 2

Figure 2: Some intranuclear inclusion bodies are PAS positive (PAS, original magnification 400).



COMMENT

Four different types of epithelial cells have been identified in the human vas deferens: principal cells, pencil cells or peg cells, mitochondria-enriched cells, and basal cells.[1] The principal cells comprise the majority of the cell population of the epithelium. These cells have a tall columnar shape and their apical surfaces are covered by stereocilia that often branch into the lumen. Coated invaginations of the apical plasmalemma are commonly observed at the bases of stereocilia. One of the most remarkable cytological features of the principal cells is the extraordinarily irregular shape of their nuclei.[1, 2] All these suggest that the principal cells have a high degree of metabolic activity and are actively involved in the uptake from the lumen.

Another striking feature of the principal cell is the presence of prominent intranuclear inclusion bodies/granules, which have a homogenous appearance and are 0.3 µm to 2.0 µm in diameter.[3, 4] Under the electron microscope, the intranuclear inclusion bodies exhibit high electron density. These granules are unreactive to both peroxidase and acid phosphatase, but are usually PAS positive and stain with acid fuchsin.[5] Although there is another type of spheroidal inclusion in the nucleoplasm of the principal cells, unlike the electron dense inclusion bodies mentioned above, they are invisible with the light microscope.[1]

In summary, the epithelium of mature human vas deferens contains prominent intranuclear inclusion bodies, which are spheroidal in shape, homogenous in nature, and positive in PAS stain. Although their origin and functional significance are not very well known, one should not misinterpret these intranuclear inclusion bodies as an indication of any pathologic process.

CORRESPONDENCE TO

Bo Wang, M.D. Department of Pathology Creighton University Medical center 601 N 30th St. Omaha, NE 68131 Tel: (402) 449-4630 Fax: (402) 449-5252 Email: bowang@creighton.edu

References

1. Hoffer AP. The ultrastructure of the ductus deferens in man. Biol Reprod. 1976;14:425-43.
2. Andonian S, Jarvi K, Zini A, Hermo L. Ultrastructural features of the vas deferens from patients undergoing vasectomy and vasectomy reversal. J Androl. 2002;23:691-701.
3. Chakraborty J, Nelson L, Jhunjhunwala J, Young M, Kropp K. Intranuclear inclusion bodies in epithelial cells of human vas deferens. Arch Androl. 1979;2:1-12.
4. Madara JL, Haggitt RC, Federman M. Intranuclear inclusions of the human vas deferens. Arch Pathol Lab Med. 1978;102:648-50.
5. Macdonald JD. Some cytochemical characteristics of certain intranuclear inclusion bodies in the epithelium of the human vas deferens. Anat Rec. 1950;106:327-42.

Author Information

Mingkui Chen, M.D., Ph.D.
Department of Pathology, Creighton University Medical Center

Bo Wang, M.D.
Department of Pathology, Creighton University Medical Center