Acta Scientific CANCER BIOLOGY (ISSN: 2582-4473)

Volume 9 Issue 4 October 2025

Editorial

Big C and Composite-Mesothelioma Testis

Anubha Bajaj*

Consultant, Histopathologist, A.B. Diagnostics, India

***Corresponding Author:** Anubha Bajaj, Consultant, Histopathologist, A.B. Diagnostics, India.

Received: September 08, 2025

Published: September 10, 2025

Testicular mesothelioma emerges as a malignant mesenchymal neoplasm engendered from serosa of tunica vaginalis. Tumefaction is associated with an aggressive biological course, akin to neoplasms confined to the peritoneal cavity. Of mesenchymal genesis, testicular mesothelioma is extremely exceptional and configures < 1% of mesotheliomas. Characteristically, tumefaction arises within middle aged to elderly population. A male preponderance is encountered [1,2]. Mean age of disease emergence is 53 years whereas neoplasm may occur within 12 years to 76 years. Testicular mesothelioma commonly emerges in individuals > 50 years whereas < 10% instances occur < 25 years. Paediatric population may expound the lesion. Nearly 1/3 lesions appear concordant with exposure to asbestos [1,2].

An estimated 0.5% of mesothelioma may arise from tunica vaginalis, especially within sites as epididymis, testis or spermatic cord. Roughly 85% of tumefaction are concordant with pleura whereas lesions confined to peritoneum emerge in ~24% instances [1,2].

Tumefaction is postulated to originate from tunica vaginalis wherein neoplasm is derived from peritoneal invagination into the scrotum.

Mesothelioma is posited to arise due to factors such as exposure to asbestos, trauma, surgical manoeuvers as herniorrhaphy or hydrocele of significant or extended duration [2,3]. Tumour emergence is associated with variable latency period ranging from initial asbestos exposure to clinical discernment of the neoplasm. Molecular alterations associated with testicular mesothelioma are inadequately defined wherein tumour cells demonstrate multiple cytogenetic anomalies although appear to lack specific diagnostic characteristics [2,3]. Loss of chromosomal regions 1p, 3p, 6q, 9q, 8p, 14q and 22q, chromosomal gains within 5p, 6p, 8q, 15q, 17q, 20 and monosomy 22 is documented [2,3]. Clinically, tumefaction represents with gradually progressive hydrocele and painless swelling of scrotum. Neoplasm is preponderantly unilateral and bilateral tumours are exceptionally encountered in ~4% instances. Additionally, manifestations as inguinal hernia, epididymitis or testicular mass may be enunciated [3,4]. Despite obtainable tumour free surgical perimeter, tumefaction is associated with inferior prognostic outcome. Mean disease specific survival emerges at 23 months and varies from 2 months to 64 months [3,4]. Cytological examination depicts moderately cellular smears wherein well differentiated tumours expound papillary clusters of epithelial cells delineating minimal cellular and nuclear atypia [3,4]. Grossly, neoplasm represents with multiple nodules confined within the hydrocele sac. Neoplasm is frequently accompanied by significant infiltration of spermatic cord, epididymis or testis. Nevertheless, a solitary tumour nodule may be exemplified. The thick walled hydrocele sac is frequently imbued with haemorrhagic fluid or neoplastic papillary excrescences. Infrequently, mesothelioma creeps along tunica vaginalis in the absence of articulated mass-like lesion [4,5]. Upon microscopy, tumefaction recapitulates classic mesothelioma. The neoplasm is preponderantly (~70%) comprised of epithelial cells wherein biphasic neoplasms are observed in ~30% lesions. Spindle shaped cellular lesions are infrequently expounded [4,5]. Epithelial subtype is comprised of epithelioid cells engendered from tunica vaginalis with configuration of papillary, tubular, adenomatoid or solid architectural configurations [4,5]. Biphasic neoplasm expounds fascicles of spindle shaped cells merging within clusters of epithelial cells, circumscribed by a scanty stroma. Well differentiated neoplasms delineate tumours characteristically comprised of uniform cuboidal epithelial cells impregnated with minimal to moderate eosinophilic cytoplasm. Cytological atypia is minimal. Besides, poorly differentiated neoplasms may be ex-

pounded [4,5]. Configured papillae demonstrate thickened, hyalinised fibro-vascular core coated by singular layer of atypical mesothelium. Circumscribing stroma may be desmoplastic. Focal necrosis may ensue. Psammoma bodies are variably encountered [4,5]. Ultrastructural examination expounds cells with epithelial and mesenchymal differentiation. Epithelial cells appear to adhere to intercellular junctions with desmosomes or junctional complexes and configuration of a distinct lumen. Innumerable cytoplasmic filaments as tonofibrils and intracytoplasmic glycogen may be discerned [4,5]. Characteristic, elongated, slender microvilli appear confined to tumour cell surface in conjunction with articulation of intracellular and intercellular lumina. Aforesaid microvilli delineate a length to diameter proportion exceeding >10 [4,5].

Sex cord/Stromal Tumours
Leydig cell tumour
Malignant Leydig cell tumour
Sertoli cell tumour
Malignant Sertoli cell tumour
Large cell calcifying Sertoli cell tumour
Intra-tubular large cell hyalinising Sertoli cell neoplasia
Granulosa cell tumour
Adult type
Juvenile type
Thecoma/fibroma group of tumours
Other sex cord gonadal/stromal tumours
Mixed
Unclassified
Tumours containing germ cell and sex cord/gonadal stromal component
Gonadoblastoma
Miscellaneous non specific stromal cell tumours
Ovarian epithelial tumours
Tumours of collecting ducts and rete testis
Adenoma
Carcinoma
Tumours of paratesticular structures
Adenomatoid tumour
Mesothelioma(epithelioid/biphasic)
Epididymal tumours
Cystadenoma of epididymus
Papillary cystadenoma
Adenocarcinoma of the epididymis
Mesenchymal tumours of spermatic cord and testicular adnexa

Table 1: World Health Organization classification of Testicular Tumours [3,4].

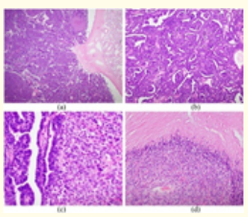

Figure 1: Mesothelioma testis delineating papillary and tubular structures lined by cuboidal epithelial cells demonstrating minimal cytological atypia. Surrounding stroma is scanty to fibrotic [11].

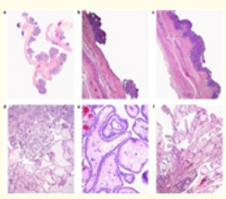

Figure 2: Mesothelioma testis depicting surface epithelial projections, cords and nests lined by cuboidal epithelial cells with minimal cytological atypia, encompassed by minimal stromal compoenent [12].

Testicular mesothelioma appears to be immune reactive to cytokeratin AE/AE3, CK5/6, CK7, epithelial membrane antigen (EMA), calretinin, podoplanin (D2-40), thrombomodulin, vimentin or Wilm's tumour antigen 1(WT1) [6,7]. Tumour cells appear immune non-reactive to carcinoembryonic antigen (CEA), B72.3, CD15(LeuM1), BerEP4 and CK20 [6,7].

Testicular mesothelioma requires segregation from neoplasms as adenomatoid tumour, florid mesothelial hyperplasia, germ cell tumour, pleomorphic sarcoma, adenocarcinoma of rete testis or epididymus, metastatic adenocarcinoma, serous papillary tumour and well differentiated papillary mesothelioma [6,7]. Ultrasonography of the scrotum demonstrates lesion as a hydrocele encased within thickened wall. A hypoechoic nodule appears superimposed upon the epididymis or tunica vaginalis. Besides, a solid para-testicular mass may ensue [8,9]. Mesothelioma of the testis may be suitably subjected to surgical procedures as radical orchiectomy. Transcrotal surgical intervention with subsequent hemiscrotectomy or hemiscrotal irradiation is frequently adopted as a recommended mode of therapy [8,9]. Retroperitoneal lymph node dissection may be beneficially adopted for treating lymph nodes indicative of metastatic deposits upon pre-operative assessment. Well differentiated papillary mesothelioma may singularly and advantageously be subjected to surgical intervention [9,10]. Factors such as extent of disease upon initial representation emerge as a significant prognostic factor wherein occurrence of distant metastases upon initial disease representation is associated with inferior prognostic outcomes [9,10]. Comprehensive or adequate surgical excision ameliorates disease free survival. Decimated (~10%) proportionate tumour reoccurrence occurs following radical orchiectomy, in contrast to simple surgical excision of the hydrocele sac which expounds neoplastic reappearance in ~30% lesions [9,10]. Well differentiated papillary mesothelioma expounds favourable prognosis in contrast to undifferentiated spindle cell mesothelioma. Neoplasms arising in young subjects are associated with superior prognostic outcomes [9,10]. Factors contributing to prognostic outcomes emerge as ~tumour magnitude ~regional lymph node metastases ~neoplastic invasion into adjacent anatomical structures ~degree of tumour differentiation [9,10].

Bibliography

1. Barbera V and Rubino M. "Papillary mesothelioma of the tunica vaginalis". *Cancer* 10 (1957): 183-189.

2. Gilbert A., *et al*. "Metastatic Mesothelioma of the Tunica Vaginalis Presenting as Scrotal and Abdominal Nodules: A Case Report and Review of the Literature". *The American Journal of Dermatopathology* 47.1 (2025): e6-e11.

3. Sweeney T., *et al*. "Identification and Management of Testicular Mesothelioma Identified Intraoperatively: A Case Series". *Cureus* 16.5 (2024): e61190.

4. Gaddam SJ and Chesnut GT. "Testicle Cancer". Stat Pearls International. Treasure Island, Florida (2023).

5. Shaker N., *et al*. "Malignant Para-Testicular Mesothelioma: A Rare Presentation in the Tunica Vaginalis of an Elderly Male With No Prior Asbestos Exposure". *International Journal of Surgical Pathology* 32 (2024): 1117-1122.

6. Stella S., *et al*. "Mesothelioma of the Tunica Vaginalis Testis: Diagnostic and Therapeutic Management. A Comprehensive Review, 1982-2024". *Cancers* 16 (2024): 3956.

7. Chys B., *et al*. "Well differentiated papillary mesothelioma of the tunica vaginalis: Case report". *Acta Chirurgica Belgica* 123 (2023): 555-558.

8. Jiang Y., *et al*. "A rare malignant mesothelioma of the tunica vaginalis testis: A case report". *Oncology Letters* 27 (2024): 172.

9. Grogg JB., *et al*. "Clinicopathological characteristics and outcomes in men with mesothelioma of the tunica vaginalis testis: Analysis of published case-series data". *Journal of Cancer Research and Clinical Oncology* 147 (2021): 2671-2679.

10. Marinaccio A., *et al*. "Association between asbestos exposure and pericardial and tunica vaginalis testis malignant mesothelioma: A case-control study and epidemiological remarks". *Scandinavian Journal of Work, Environment and Health* 46 (2020): 609-617.

11. Image 1 Courtesy: Sage Journals

12. Image 2 Courtesy: Nature.com