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Immunohistochemical detection of myosin heavy chain isoforms in human cremaster muscle

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Cremaster muscle (CM) forms a thin network of fascicles, around the spermatic cord and testis, connected by loose areolar tissue forming the cremasteric fascia. CM has a non somitic embryologic origin, as it derives from mesenchymal differentiation of the gubernacular tip (1).Thus it is not to be considered a passive extension of internal oblique muscle. CM is composed both of striated and smooth muscle cells; it is innervated by genitofemoral nerve (2). Its striated fibres, in contrast with skeletal muscles, present with a multifocal innervation by multiple neuromuscular synapses (3). Myosin isoforms are the major determinant of the contractile and biochemical heterogeneity of skeletal muscle fibers. Non somitic muscles, such as extrinsic ocular muscles, show a distinct pattern of myosin heavy chains distribution. The aim of our study was to characterize the expression of myosin isoforms in CM fascicles; biopsy samples were obtained from cases of cryptorchidism, retractile testis and inguinal hernia, undergoing surgery. Immunohistochemistry confirmed the previously identified type 1 predominance (1) and showed a high occurrence of hybrid fibres, coexpressing two or more myosin isoforms. In contrast with age-matched limb muscles, persistence of developmental/neonatal myosin heavy chains was detected, beyond the determined timecourse of physiological shifting from immature isoforms (4). On the basis of shared peculiar embryological derivation, expression of superfast extraocular myosin MyH13 was also investigated on CM specimens, showing sarcoplasmic reactivity, undetectable in limb muscles. The high share of hybrid fibres, the persistence of immature myosin and MyH13/MyHCslow coexpression are peculiar features, suggesting a functional/biochemical individuality of CM, related with multiple innervation and distinct embryological development.

References

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Keywords
Cremaster; myosin heavy chain; hybrid fibres; immunohistochemistry.