

## **HISTOLOGY OF THE ANTERIOR FIBROMUSCULAR STROMA ISOLATED AT SURGERY**

### Hypothesis / aims of study

To report a surgical technique to isolate the Anterior Fibromuscular Stroma (AFMS), intact, and the histology of the freshly submitted specimen.

### Study design, materials and methods

In March 2004 we performed successive Posterior Urethral Sparing Radical Retropubic Prostatectomy. Previously during the performance of this procedure we identified a consistent structure we could place a right angle clamp under, and incise, in order to gain access to the bladder neck and the posterior urethra. We changed our surgical technique to isolate the AFMS from its attachments to the detrusor, the urethra and the lateral prostatic capsule; the AFMS was separated from the prostate and the bladder with a combination of mostly blunt and sharp dissection. Its attachments were the lateral prostate capsule, the anterior and anterolateral bladder and the apical prostatic urethra to the level of the verumontanum. These structures were sharply separated. The AFMS was not attached to the posterior segment of the prostatic urethra, and could be bluntly dissected from it.

We sent the AFMS tissue in a separate container from the cancerous prostate gland. Light microscopic analysis on H and E and Trichrome prepared sections were performed. S-100 immunohistochemistry was also performed.

### Results

Light microscopic analysis on H&E prepared sections reveal that the proximal and central portions are composed predominantly of well organized vertically oriented smooth muscle bundles that approximate those of the bladder neck from which they are thought originate. Laterally and anteriorly towards the urethra and distally towards the apex, the smooth muscle bundles become loose and haphazard with varying degrees of fibrosis and adipose tissue. Distally and laterally, small striated muscle fibers are seen. No glandular tissue is identified in either specimen.

Immunohistochemistry with s-100 identified large, medium sized and small nerves widely dispersed throughout the AFMS.

### Interpretation of results

The AFMS is not part of the glandular prostate gland. It may act as an opening mechanism to open the prostatic urethra. Its rich neurovascular network and smooth muscle abundance qualifies it as a candidate for this role as a moveable structure capable of providing work. The hypertrophy and fibrosis of the AFMS looks remarkably like that seen in the detrusor muscle of which we compare it to on Trichrome staining.

Adipose tissue found in the AMS places it outside of the prostate gland, by standards set by pathologists for extracapsular disease. Prostate cancer seen in the AFMS may be interpreted as a potential T3 lesion, because of this fact.

Isolation of the AFMS is possible in the human, and similar structures can be found in rhesus monkeys as well.

### Concluding message

The AFMS is becoming a more recognized factor in normal and pathologic micturition. Hypertrophy and fibrosis of the smooth muscle of the AFMS is identical to the same condition seen in the detrusor, when the prostate gland has enlarged and obstruction has occurred. The AFMS is outside the glandular prostate gland. The finding of fat in the AFMS may have implications for prostate cancer staging. The AFMS has been the subject of study in archival tissue only. This report describes a surgical technique to isolate the AFMS, intact, and the histology of that tissue. The tissue can be clinically separated from the rest of the prostate gland, prostatic urethra and bladder, at surgery. Fresh tissue can be harvested for basic research of the AFMS. Isolation of the AFMS in lower vertebrates has yet to be investigated.

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