

PRIMARY BLADDER NECK OBSTRUCTION MUSKULOSKELETAL FINDINGS AT IMAGING

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ABSTRACT

Primary bladder neck obstruction (PBNO) is a poorly understood benign urological condition, defined as an inappropriate or inadequate relaxation of the bladder neck during micturition [1].

It was previously hypothesized the existence of a possible correlation between altered biomechanics of the pelvis and urethral sphincters activity in male patients reporting voiding dysfunction in the absence of neurological or orthopedic signs [2].

Therefore, we decided to investigate whether a correlation and/or a cause-effect relationship may exists between these two conditions.

METHODS

Consecutive patients diagnosed with PBNO by the same urologist at our Institution were enrolled in the present study. All the subjects underwent deep anamnestic collection, careful characterization of the reported symptoms, accurate physical examination, urinalysis, patient reported outcome measures, frequency-volume chart, uroflowmetry with post-void residual urine, abdominal ultrasound, outpatient flexible urethrocystoscopy, **pain assessment** [ICS 2018 abstract #607], and second level imaging (alternatively, **full spine X-ray** or **pelvic-perineal MRI**). Axial, coronal, and sagittal T1W, T1TSE, DPFS, STIR images (depending on the 1.5T or 3T MR scanner) were obtained in 22 subjects; full spine X-ray on a single image was obtained from 35 additional subjects. MRI were performed by the same radiologist, while X-ray images were reviewed by the same specialist.

RESULTS 1

57 newly diagnosed male patients with PBNO were enrolled in the study; mean age at diagnosis was **39.6 ± 8.6 years**. None of the performed imaging showed normal findings. When compared to normalcy, the major pathological findings **at full spine X-ray** were lumbar **hyperlordosis**, **horizontalization of the sacrum and increase of the sacral slope**, **hooked coccyx**, **anterior tilt of the pelvis**, **lower limb length discrepancy**, variable degrees of scoliosis, ischiatic outlet asymmetry (sacrospinous and sacrospinous ligaments; piriformis and internal obturator muscles), partial or complete congenital sacralization of L5 vertebrae, mild anterolisthesis of L5 on S1, radiographic L5-S1 disc height reduction.

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RESULTS 2

The main anomalies (skeletal or muscular) identified **at MRI** were external **urethral muscle thickening**, **hooked coccyx or its anterior angulation** [Figure 1], **ischiofemoral impingement** [Figure 2], **sacroiliac joint sclerosis or sacroiliitis**, sacrotuberous ligament thickening, piriformis muscle contraction or hypertrophy, pubo-rectal muscle hypertrophy, levator ani muscle thickening, pelvic upslip or rotation, sclerosis or erosion at the pubic symphysis, sacralization or hemisacralization of L5.

The identification of pathological characteristics at full spine X-ray and MRI was based on known morphological presentation in the normal male and on comparison with anatomy. **None of the enrolled subjects perceived postural defects**. All the subjects presented various degree of discordances from normalcy; some of these pathological aspects were recurrent, but unfortunately a unique common pattern was not identified. Nevertheless, **at MRI we were able to categorize abnormalities into four groups: 1. hypertrophy or hypertonicity of pelvic floor muscles**, which were present – with different degrees – in all the 22 subjects; **2. tendon inflammation**; **3. joints inflammation or sclerosis** (e.g. sacroiliac or pubic symphysis); **4. skeletal abnormalities** (e.g. anterolisthesis or hooked coccyx). No relevant differences in diagnostic quality were noticed between the two MR scanners (1.5T versus 3T). The observations provided with our research seems to be coherent with previously published hypothesis [2] and gait analysis evaluations in subjects with chronic voiding dysfunction [3].

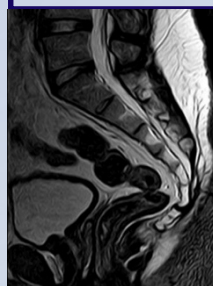


Figure 1: hooked coccyx, 42-years-old patient, sagittal view



Figure 2: ischiofemoral impingement, 35-years-old patient, axial view.

CONCLUSIONS

Postural imbalances and musculoskeletal modifications seems to be strictly associated with PBNO in male patients. To date, it is not known whether a cause-effect mechanism is present. Nevertheless, **we suggest to introduce second level imaging** (such as full spine X-ray or pelvic-perineal MRI) **in selected male patients with chronic voiding symptoms**, to better define clinical features.

REFERENCES

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