

MR IMAGING OF MUSCLES SUPPORTING THE PHALLUS: A NEW INSIGHT TO THE TRUE SEX IN AN INTERSEX CHILD?

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Purpose: In an intersex child presenting with ambiguous external genitalia, the karyotype, genetic abnormality and hormonal abnormality determine the sex of rearing and correct gender assignment. Supporting muscles of phallus viz., bulbospongiosus (BS), ischiocavernosus (IC), and superficial transverse perinii (STP) have been recently stated to help to differentiate enlarged clitoris from penis. We evaluated these muscles on MRI and correlated them with the chromosomal sex (karyotype) and genitogram appearances.

Materials and Method: Coronal and axial T1 and T2W MR images of 32 intersex patients (age 13d-17y) were retrospectively analysed for muscles supporting the phallus. They were graded as well developed, non-visualised and indeterminate based on the age matched controls. BS and IC were considered together and STP separately. It was correlated with karyotype (chromosomal sex) and urethral type (hormonal influence) on a contrast genitogram. Urethra was considered male, female or indeterminate type. Depending on the high, intermediate or low insertion respectively. Long urethra was considered male type.

Results: Of all 32 patients evaluated for BS and IC muscles, 17 had well developed (Gp 1), 7 had poor or non-visualised (Gp 2) and 8 had indeterminate (Gp 3) muscles. Of all 17 patients in Gp 1, 14 were XY, 2 were XX and one was mosaic 46 XX/ X0. In this Gp, 9 had male, 6 had female and 2 had indeterminate type of urethra on Genitogram. Of 7 patients in Gp 2, 4 were 46XY and 3 were 46XX. In this Gp, 4 had female and 3 had indeterminate type urethra on Genitogram. Of 8 patients in Gp 3, 4 were 46XY, 3 were 46XX, and 1 was 46XX/ X0. In this Gp 2 had male and 6 had female type urethra on Genitogram. Of all 32 patients STP muscles were visualised in 8 (Gp 4), non-visualised in 20 (Gp 5) and equivocal in 4 (Gp 6). In Gp 4, 7 were 46 XY and 1 was 46XY/ X0. Urethral type was male in 5, and female in 3 on Genitogram. In Gp 5, 14 were XY, 5 were 46XX and 1 was 46XY/ X0. Urethra was male in 5, female in 11 and indeterminate type in 4 on Genitogram. In Gp 6, all 4 were XX; 1 had male and 3 had female type of urethra on Genitogram.

Conclusion: Well developed BS and IC muscles are a better indicator of chromosomal than hormonal sex. It suggests a likely male karyotype. However, when these muscles are indeterminate or non-visualised, it can not predict the chromosomal sex, but may suggest a female or indeterminate urethral type. STP muscles are not visualised in majority but when seen it suggests a likely male karyotype. Poor or non-visualisation of this muscle gives no clue about the chromosomal sex or urethral type.

Presentation Type: Oral Presentation

Authorize Publishing: Yes

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