



Magnetic Resonance Imaging (MRI) in Pelvic Fracture Injuries to evaluate Urethral Gap - A new Point of technique

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INTRODUCTION

Pelvic Fracture Urethral Injuries (PFUI) are complex injuries.

Traditionally the gap between the disrupted urethral ends has been assessed by retrograde urethrogram (RGU) and voiding cystourethrogram (VCUG).

MRI has been used in assessing the urethral gap (1,2)

We present a simple modification of the MRI protocol to achieve better image acquisition which resembles the conventional imaging and is easier to interpret by urologists.

AIM

The aim of the study was to prospectively evaluate the urethral gap in patients with PFUI to evaluate the urethral gap.

METHODS

- 10 consecutive patients with Complex PFUI were selected for the study. (Age 21-43 Yrs)
- Initially, T2 MR acquisition was done, using standard protocol. Three Radiologists were asked to measure the urethral gap in these images. Fig 1
- Next, using our modified protocol
 - Pre procedure Tamsulosin 400 mcg
 - Bladder filled with normal saline and SPC clamped
 - Lignocaine jelly and saline instilled in urethra
 - Patient asked to strain to pass urine
 further T2 images were obtained Fig 2
- Images were reviewed again by the same radiologists with a visual score - very satisfactory (4), satisfactory (3), disappointed (2) and very disappointed (1)

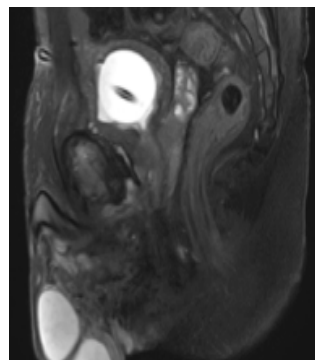


Fig 1. MRI standard T2 image

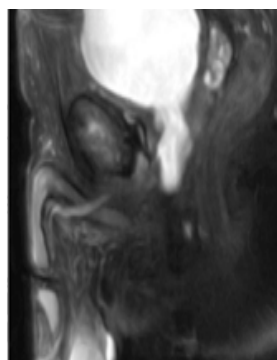


Fig 2. MRI performed with a full bladder using saline and pre procedure alpha blocker

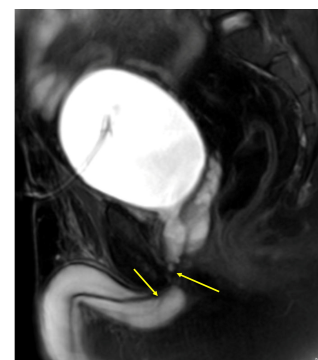


Fig 3. Urethral Delineation using Saline mixed with Lignocaine gel in Urethra, retained with a swab tied round Glans

RESULTS

- Bladder neck relaxation was achieved with straining, under the effect of Tamsulosin. (Fig 2)
- The distended urethra was well outlined by the presence of saline and lignocaine gel retained by a tight gauze around glans (Fig 3)
- As illustrated in the table, there was a better understanding of the urethral gap using the new protocol
- In 8 out of 10 patients, the radiologists score was 'very satisfactory'

Patient No	MRI Standard Gap (cm)	MRI Novel Technique Gap (cm)	Measured Difference (cm)	Surgical Approach	Radiologists Assessment Mean (range 3-4)
1	4	3.2	0.8	Step 3	4
2	3.5	2.7	0.8	Step 3	4
3	3	2.4	0.6	Step 3	4
4	4	3.3	0.7	Step 3	4
5	5	4	1	Step 4	4
6	4	3	1	Step 3	4
7	3.5	2.4	1.1	Step 3	4
8	3	2.6	0.4	Step 3	3
9	2.8	2.1	0.7	Step 3	4
10	3	2.7	0.3	Step 3	3

CONCLUSIONS

1. Complex PFUIs require better understanding for effective planning for successful outcome.
2. Conventional MRI gives limited information in complex PFUI cases.
3. This protocol uses urine and saline as a natural contrast while providing excellent image acquisition to evaluate the gap in PFUI cases.
4. We recommend that this novel modification of MRI as a standard protocol, whenever further imaging is required in complex PFUI cases.
5. MRI can also provide information regards to bony fragments, complex fistulas and double transections in these complex cases.
6. We propose a multicentre study to evaluate this refined MR protocol. This will add this important modality to the urologist's repertoire in evaluating these cases.

ACKNOWLEDGEMENTS

We would like to thank Star Imaging Centre in assisting with the study.

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