

ASSESSMENT OF VOIDING FUNCTION USING UROFLOWMETRY IN PATIENTS WITH PERSISTENT URINARY INCONTINENCE FOLLOWING SUCCESSFUL CLOSURE OF OBSTETRIC VESICOVAGINAL FISTULA

Hypothesis / aims of study

A woman with an obstetric vesicovaginal fistula (VVF) suffers from continuous urinary incontinence and in some cases prolonged obstructed labor may destroy the entire bladder base. Since the nerve supply of the detrusor runs through the trigone of the bladder, it has been hypothesized that injuries of this kind may produce a degree of neuropathic bladder dysfunction [1]. Over the past decade, studies have reported VVF closure rates up to 90%, but the “continence gap” of persistent incontinence following fistula closure remains a significant clinical problem with 39-55% of women remaining incontinent (closed but wet). To date, no study has been performed to investigate voiding function in the “closed but wet” patient population. We aimed evaluate voiding function using uroflowmetry in patients with persistent UI following successful VVF closure in Ethiopia.

Study design, materials and methods

Thirteen consecutive patients with complaints of persistent UI were recruited between November 2013 and December 2014. Uroflowmetry was performed with the aid of a custom-designed voiding platform that allowed patients to void in their natural squatting posture. Maximum flow rate (Q_{max}), average flow rate (Q_{ave}), time to maximum flow rate (TQ_{max}), voiding time, flow time, and voided volume (VV) were acquired using a spinning-disk uroflowmetry transducer and the Medtronic Duet Logic Urodynamic System (Medtronic, USA). Since medical charts of most patients generally showed records of lower voided volumes than those in normal healthy women and because voided volume correlates positively with flow rate, we compared the patients' flow rates with the expected mean normal flow rates at the given voided volume using equations from the female Liverpool nomogram [2] and the PGIMER nomogram [3]. Additionally, corrected Q_{max} (cQ_{max}) was calculated using Von Garrellt's equation. Student's t-test or the Mann-Whitney Rank Sum Test was used to determine statistical significance between observed flow rate values and expected normal values using the nomograms. Descriptive data was presented using mean ± standard deviation or median and range. P-values <0.05 were considered statistically significant.

Results

The mean age was 35±11 years, the median duration of labor was 2 (1 - 6) days, the median time from causative delivery to VVF closure was 4 (3-153) months, the median time from VVF closure to uroflowmetry testing was 1.8 (0.5-419) months, and the median fistula diameter was 3 (2 - 6) centimeters. Of the 10 patients with available surgical notes, bladder size was indicated as good, fair, or small in n=4, n=5, and n=1, respectively. The typical flow pattern observed on uroflowmetry was characteristic of detrusor impairment. The observed mean Q_{max} was 7.7±3.6 (range=1.2 - 13.8) ml/s. The observed Q_{max} (7.7±3.6 ml/s) was significantly lower than the expected normal values based on the Liverpool (15.2±5.8 ml/s) or PGIMER nomogram (14.4±3.3 ml/s), p=0.002 and p<0.001, respectively. Similar significant results were found for Q_{ave} (observed: 3.1±1.5 ml/s, Liverpool: 8.0±3.8 ml/s, PGIMER: 7.5±2.3 ml/s). The mean voided volume was 72±48ml, and mean TQ_{max}, voiding time, and flow time were 16±15s, 29±16s, and 23±14s, respectively.

Interpretation of results

Our data show that in addition to a diminished ability to store urine, patients who remain incontinent after successful fistula closure have significant voiding dysfunction characterized by abnormal flow patterns and low flow rates. The cause of this dysfunction is unclear given that the majority of patients in this study had good or fair sized bladders. However, the mean voided volume was 72±48ml suggesting that bladder size at the time of surgery may not be representative of current bladder capacity.

Concluding message

To the best of our knowledge, this is the first study to investigate voiding function in fistula patients who remain incontinent after successful VVF closure. Although the data suggest significant voiding dysfunction, the cause of this dysfunction is unknown. However, this study is consistent with the hypothesis that these patients may have some degree of neuropathic bladder dysfunction. Further studies are needed to determine the effects of prolonged continuous UI on the structure and function of the bladder, and investigations utilizing pressure-flow urodynamics are needed to better elucidate the spectrum of lower urinary tract dysfunction in this patient population.

References

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Disclosures

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