



## Endoscopic Dynamic Hydrodistension Classification for the Ureteral Orifice in Vesicoureteral Reflux: Is There Good Concordance Between Observers?

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### Abstract

**Introduction:** The Dynamic Endoscopic Hydrodistension Grade is a categorical scale useful for defining the degree of ureteral opening during endoscopic treatment of Vesical Ureteral Reflux (VUR).

**Objectives:** To verify the interobserver concordance of the Dynamic Endoscopic Hydrodistension Grade classification.

**Material and Methods:** Prospective observational study, collecting consecutive cases of endoscopic treatment for VUR in our centre for two years. Baseline characteristics of the sample were collected. In addition, two experienced paediatric urologists, along with a less experienced resident, blindly recorded (without sharing with the rest) the grade they thought corresponded to the meatus that had just been injected. The grades on the scale cover 4 categories, from H0 (closed meatus with hydrodistension) to H3 (total opening of the meatus, including ureteroscopy with the cystoscope). A descriptive analysis of the sample was carried out, and the kappa coefficient was studied to check the interobserver agreement between the expert urologists among themselves, and between each of them and the novice urologist.

**Results:** Data were collected from a total of 54 ureteral units, 23 (42.6%) corresponding to males and 31 (57.4%) to females. The mean age at the time of injection was 32 +/- 14 months. A satisfactory, almost perfect correlation was found between expert urologists (kappa=0.766, p<0.001). On the other hand, a satisfactory correlation was found between each expert urologist and the novice urologist (kappa=0.614 with p<0.001, and kappa=0.678 with p<0.001).

**Conclusions:** The dynamic hydrodistension classification presents a good concordance between observers, this concordance being greater among urologists experienced with the endoscopic treatment of VUR.

**Keywords:** Vesicoureteral reflux; Dynamic hydrodistension; Interobserver concordance

### Introduction

Vesical Ureteral Reflux (VUR) affects approximately 1% of children and can promote pyelonephritis, which can lead to significant sequelae such as renal scarring, hypertension and renal failure [1]. Treatment options for VUR include endoscopic injection of dextran Omer-hyaluronic acid into the distal ureter and ureteral orifice [2]. For this, it is important to perform dynamic hydrodistension, which is performed by placing a pressurized jet of irrigation fluid with the tip of the cystoscope into the ureteral orifice. Dynamic hydrodistension of the distal ureter allows visualization of the intraurethral injection site as well as an assessment of the progress of treatment. Ureteral dynamic hydrodistension is classified according to the Dynamic Endoscopic Hydrodistension Grade (H0: absence of ureteral dilatation; H1: dilatation of the ureteral orifice only; H2: allows visualization of the intramural ureter; H3: allows visualization of the extramural ureter) [3].

### Objectives

Asses the interobserver agreement of the Dynamic Endoscopic Hydrodistension Grade.

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**Table 1:** Reliability of categorical ratings, particularly in research where consistency between raters is crucial.

Variables	Values
<b>Gender</b>	
Male	23 (42.6%)
Women	31 (57.4%)
Age in months (average)	32 +/- 14
Weight in Kg (average)	16.7 +/- 11.7
Size in cm (average)	95.4 +/- 20.8
<b>Side</b>	
Left	30 (55.6%)
Right	24 (44.4%)
<b>Laterality</b>	
Unilateral	21 (38.9%)
Bilateral	33 (61.1%)
<b>Preoperative CUMS Degree</b>	
I	7 (13%)
II	7 (13%)
III	16 (29.6%)
IV	18 (33.3%)
V	3 (5.6%)
Continuous preoperative prophylaxis	54 (100%)

## Materials and Methods

Prospective observational study, collecting consecutive cases of endoscopic treatment for VUR in our centre for two years. Baseline characteristics of the sample were collected. In addition, two paediatric urologists with experience in this surgery, together with a resident (with less experience), recorded in a blinded manner (without sharing with the rest) the grade that they thought corresponded to the meatus that had just been injected. The grades on the scale cover 4 categories, from H0 (closed meatus with hydrodistension) to H3 (total opening of the meatus, including ureteroscopy with the cystoscope). A descriptive analysis of the sample was carried out, and the kappa coefficient was studied to check the interobserver agreement between the expert urologists among themselves, and between each of them with the novice urologist.

## Results

Data were collected from a total of 54 ureteral units, 23 (42.6%) males and 31 (57.4%) females. The mean age at injection was 32 +/- 14

months. A satisfactory, almost perfect correlation was found between the expert urologists ( $\kappa=0.766$ ,  $p<0.001$ ). On the other hand, a satisfactory correlation was found between each expert urologist and the novice urologist ( $\kappa = 0.614$  with  $p=< 0.001$ , and  $\kappa=0.678$  with  $p<0.001$ ) (Table 1).

Kappa values range from -1 to 1, with negative values indicating disagreement worse than chance, and positive values reflecting levels of agreement. Interpretation of kappa is as follows: values less than 0 indicate poor agreement, 0 to 0.20 reflects slight agreement, 0.21 to 0.40 indicates low agreement, 0.41 to 0.60 suggests moderate agreement, 0.61 to 0.80 shows substantial agreement, and values between 0.81 and 1.00 represent nearly perfect or perfect agreement. This scale helps evaluate the reliability of categorical ratings, particularly in research where consistency between raters is crucial [4].

The inter-observer reliability analysis reveals substantial agreement between Observer 1 and Observer 2, with a kappa coefficient of 0.766 ( $p<0.001$ ), indicating good but not perfect agreement. Comparisons between Observer 1 and Observer 3 show a moderate to substantial level of agreement, with a kappa coefficient of 0.614 ( $p<0.01$ ), while Observer 2 and Observer 3 demonstrate substantial agreement, reflected in a kappa coefficient of 0.678 ( $p<0.001$ ). These findings align with the interpretation that kappa values between 0.61 and 0.80 denote substantial agreement, though not perfect, supporting reliable consistency across observer assessments.

## Conclusions

The dynamic hydrodistension classification shows good interobserver agreement, with greater agreement among urologists experienced in endoscopic treatment of VUR.

## References

- Rodriguez E Jr, Weiss DA, Copp HL. Adherence to antibiotic prophylaxis in children with vesicoureteral reflux. *Adv Urol.* 2011;2011:134127.
- Williams G, Hodson EM, Craig JC. Interventions for primary vesicoureteric reflux. *Cochrane Database Syst Rev.* 2019 Feb 20;2(2):CD001532.
- Cerwinka WH, Scherz HC, Kirsch AJ. Dynamic hydrodistention classification of the ureter and the double hit method to correct vesicoureteral reflux. *Arch Esp Urol.* 2008;61(8):882-7.
- S M Vieira, U Kaymak and J M C Sousa. Cohen's kappa coefficient as a performance measure for feature selection. *International Conference on Fuzzy Systems, Barcelona, Spain.* 2010;1-8.