

In Vivo Porcine Evaluation of the Multiphze™ Device: A Self-Contained Bladder Irrigation System

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Introduction

Current standard bladder irrigation methods for clot evacuation are cumbersome, inefficient, and hazardous due to the risk of blood and urine contamination of the patient, environment, and provider. The latest iteration of the Multiphze™ enclosed irrigation system (Multiphze LLC) is a novel self-contained system designed to eliminate spillage while improving the efficiency of clot evacuation (figure 1).

Methods

Two female, juvenile Yorkshire pigs were anesthetized, following which 100 ml of blood was drawn via a femoral vein and mixed with 44.4 ml of Glow-Bright Concentrate. The bladders were drained with a 24 Fr 6 eye hematuria urinary catheter; 100 ml of blood and Glow-Bright Concentrate mixture was instilled into the bladder using a Bard Irrigation Kit (BIK). After 5 minutes, 4 individuals (a urology intern, an endourology fellow, a senior faculty endourologist, and a foreign-trained urologist-researcher) with prior experience using a BIK performed bladder irrigation with 3L of sterile water utilizing both the BIK technique and the Multiphze system in two separate trials. The time of each irrigation cycle and clarity of drainage fluid using a spectrophotometer were recorded after each liter of irrigation. Total areas of spillage on the procedural fields were identified with a Wood's lamp and quantified.

Results

The mean clarity measurements at the end of 2 liters of irrigant for the Multiphze and BIK trials were similar to the clarity obtained after 3 liters; however, the mean time to achieve this level of clarity with the Multiphze was 50% less than with the BIK (6.98 min. vs. 14.07 min.) ($p < 0.001$) (Table 1). Wood's lamp illumination revealed a 100% reduction of spillage with Multiphze compared to BIK (208.95 cm² vs. 0) ($p = 0.072$), as there was no spillage with Multiphze.

Conclusions

In a porcine model, the Multiphze irrigation system significantly halved the time to successfully clear a clot-filled bladder and eliminated spillage and contamination.

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Figure 1. The new Multiphze™ enclosed irrigation system



Table 1. Mean irrigation time, fluid clarity, and spillage area among all operators

	Standard	Multiphze	
Time to irrigate 1 L (min.)	7.59 [7.17-7.93]	4.33 [3.43-5.0]	$p < 0.001$
Time to irrigate 2 L (min.)	14.07 [12.6-15.3]	6.98 [6.37-7.93]	$p < 0.001$
Time to irrigate 3 L (min.)	20.05 [17.8-21.8]	9.32 [8.05-10.4]	$p < 0.001$
Fluid clarity at 1 L (%)	53.9 [32.5-74.1]	39.6 [3.53-64.7]	$p = 0.433$
Fluid clarity at 2 L (%)	72.6 [71.4-74.1]	72.3 [68.6-76.1]	$p = 0.884$
Fluid clarity at 3 L (%)	74 [73.3-74.5]	73.2 [71.0-75.3]	$p = 0.431$
Spillage area (cm ²)	208.95 [88.0-492.7]	0 [0-0]	$p = 0.072$