

Development of a Cost Effective and Efficient Teaching Model for Flexible Cystoscopy

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ABSTRACT

Aim: To present a latex glove training model for flexible cystoscopy.

Methods: The latex glove model was used to construct a model for teaching flexible cystoscopy to postgraduate trainees in urology; the materials used in this model are freely available and economic. In this pilot study we observed the effectiveness of this model, which can be improved upon to make different tasks of variable difficulty. In this study the glove was considered as the bladder and the finger stalls as means of learning to maneuver the flexible cystoscope.

Results: The most common problem faced by trainees was the movement of the lever and to stay oriented to what part of the bladder they were observing, also there were many un-purposeful movements and collision with the walls of the glove.

Conclusion: The latex glove method is a cost effective manner of teaching residents the technique of flexible cystoscopy.

Keywords: Flexible cystoscopy, ureterorenoscopy, endoscopy

INTRODUCTION

Cystoscopy is one of the most commonly performed intervention in urology. While rigid cystoscopy has been widely employed in Pakistani hospitals, flexible cystoscopy has yet to be routinely practiced. Although rigid cystoscopy is considered the gold standard, both for therapeutic and diagnostic intervention, however it has many disadvantages. Need for anaesthesia, positioning table, need for operating room are some of the major limitations of rigid cystoscopy. Flexible cystoscopy provides an alternative, as it can be performed in an office setup, there is no need for anaesthesia and it has a very low complication rate.

Performing flexible cystoscopy and instrument handling is considerably different from rigid cystoscope. Hence, many urologists are unable to operate a flexible cystoscope. Traditional cystoscopy training is largely based on observation and urologists usually accumulate experience only by operating on patients¹. Studies assessing the effectiveness of a virtual reality simulator (VRS) in training flexible cystoscopy skills have shown excellent results^{2,3,4}. However the VRS is an expensive tool and cannot be afforded by many hospitals. The workload of cystoscopy for various reasons is tremendous and at current, rigid cystoscopy when done under local anaesthesia is very painful and expertise for flexible cystoscopy is

limited. With this problem at hand we have developed a very simple low cost model, which can be utilized to train our residents in the technique of flexible cystoscopy.

MATERIALS AND METHODS

The materials required for this are:

1. Flexible cystoscope
2. Surgical gloves
3. Rubber cork (antibiotic bottle cap)
4. Silk suture on needle
5. Saline for inflation of the glove
6. Light source
7. Endoscopic camera

The teaching model was constructed with all the equipment listed above (Fig 1a). A hole was cut out in the cork carefully with a scalpel to allow the flexible cystoscope through it. The glove was turned inside out and all the fingers were marked to number and identify each finger stall. After carefully suturing the glove to the rubber cork the water was filled into the glove and the whole assembly was then suspended into an opaque box not allowing direct vision of the glove. After this the camera was mounted onto a flexible cystoscope, light was attached and white balance and focusing was performed. The cystoscope was introduced into the glove and visualization of all fingerstalls and top and bottom was done.

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Fig 1a

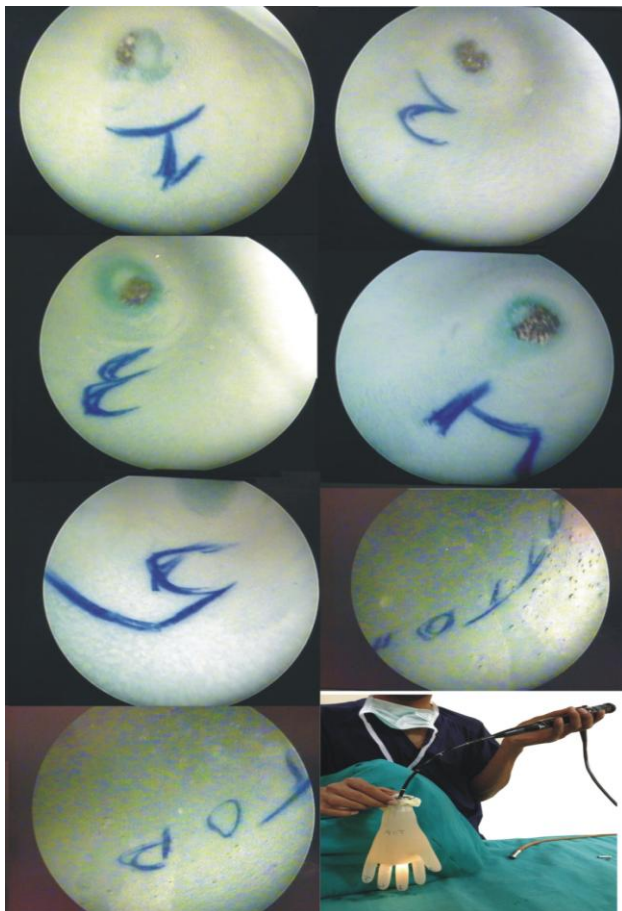


Fig. 1b

RESULTS

Residents in training for FCPS and MS were given the task to first get the feel of the model with a rigid cystoscope, which they were used to, and then they were given instructions on how the flexible cystoscope works and what precautions have to be taken to avoid damaging the scope. This was followed by attempts by 8 residents and note was made of the difficulties they were facing. The foremost difficulty was the difficulty in understanding the movement of the lever and the changing field, the ability to focus at any certain position and too many non purposeful movements. Among others were too much bending of the scope, collision of the scope with the wall of the glove and difficulty in maintaining the lumen in the center of the field.

DISCUSSION

By comparison with rigid cystoscopy, flexible cystoscopy has a number of advantages and is associated with little injury, reduced pain, no blind zone, and no limitation of a patient's position.⁵ Hence, this kind of procedure can be easily accepted by patients. According to a survey, approximately 89% of the patients with superficial bladder cancer were more willing to choose flexible cystoscope examination during follow-up⁶. In addition, flexible cystoscopy also forms the basis of performing flexible ureterorenoscopy. However, flexible cystoscopy has the limitation of a small field of view and difficulty with orientation. Although the procedure can be mastered following a period of training, flexible cystoscopy has not been widely used in Pakistan. Thus, many urologists lack experience with flexible cystoscopy.

Direct manipulation of a flexible cystoscope on patients is not practical. Practical, legal, and ethical considerations have created an increasing need for training opportunities outside the clinical setting^{7,8}. However, very few training physical or biological models for training endoscopy of the lower urinary tract have been reported^{9,10}. The described model is a very affordable and practical solution to start training of junior residents gradually leading them into doing flexible cystoscopies on patients.

The model can be improved upon and different kind of lesions can be drawn at different places to check the capability of the residents to identify them. In our future program we have planned a study to check the efficacy of this method and check if the residents benefit from this and plot it according to the global rating scale.

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