VirtaMed UroSim™
Module descriptions
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v1409
TURP basic skills
First steps in trans-urethral urologic surgery

Module description
This module contains basic tasks which allow the trainee to acquire all the skills necessary to safely perform a complete TURP procedure. The TURP procedure is broken down into its various steps, visualization, bleeding, resection etc. A training curriculum provided by the module, relies on self practice in a safe environment until reaching the desired proficiency level. Learners gain experience in identifying the anatomical landmarks, cystoscopy, performing a safe resection, and in controlling bleeding.

SimProctor™ educational guidance
Instructions on safe procedure performance are applied to the anatomical setting, incorporating best practices as defined by an expert panel, helping to learn the main behavioral rules during the procedure. The trainee is provided with tips and tricks to improve performance, ghost tools to demonstrate correct behavior. Videos to guide the trainee and various anatomical views are provided, such as an external and side view to help develop orientation and spacial awareness.

Learning objectives
- To develop knowledge of anatomy and landmarks.
- To become proficient at using a resectoscope.
- To become accustomed to the fulcrum effect and 30° angled scope.
- To acquire depth perception and hand-eye coordination.
- To master safe resection techniques.
- To efficiently control and manage bleeding and complications.

Instruments
The module requires the endoscope delivered by VirtaMed.
Case descriptions

Visualization 1
- Colored aids indicate the correct route and highlight important landmarks
- Easy guided case for first steps in TURP

Visualization 2
- Colored aids indicate the correct route and highlight important landmarks
- Anatomical landmarks not as easy to detect

Bleeding control 1
- Partially resected prostate
- Bleedings start in various places automatically

Bleeding control 2
- Partially resected prostate
- Bleedings start in various places automatically
- Faster and more bleedings than in "Bleeding control 1"

Resection 1
- Abstract median lobe only
- No complications

Resection 2
- Abstract side lobes only
- No complications

Partial TURP 1
- The prostate is already partially resected
- Normal viewing conditions

Partial TURP 2
- The prostate is already partially resected
- Challenging viewing conditions
TURP full procedures
Safely train on complete TURP procedures

Module description
8 virtual patients include small to large prostates with hypertrophies of both lateral and median lobes, presenting various challenges such as difficult access and heavy bleeding. The TURP courses teach an understanding of the anatomical landmarks, depth perception and hand-eye coordination during the TURP procedure and how to control flow and bleedings for a clear view during the.

Learning objectives
- To establish clear viewing conditions during the procedure.
- To identify anatomical landmarks and obtain a clear 3D mental image of the anatomy.
- To resect the prostate while safely handling the loop electrode.
- To coagulate bleeding sources with the loop electrode.
- To perform a safety inspection at the end of the procedure.

Instruments
The module requires the endoscope delivered by VirtaMed.
### Case descriptions

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
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| Easy 1  | - Very small prostate  
          - Approximately 25 grams  
          - Small median lobe and small side lobes |
| Easy 2  | - Small prostate  
          - Approximately 30 grams  
          - Small median lobe and small side lobes |
| Easy 3  | - Large prostate  
          - Approximately 70 grams  
          - Very large median lobe and medium side lobes |
| Medium 1| - Medium-sized prostate  
          - Approximately 50 grams  
          - Small median lobe and large side lobes  
          - Higher tendency to bleed |
| Medium 2| - Small to medium-sized prostate  
          - Approximately 40 grams  
          - Normal median lobe and medium-sized side lobes  
          - Higher tendency to bleed |
| Medium 3| - Large prostate  
          - Approximately 70-80 grams  
          - Very large median lobe and medium-sized side lobes  
          - Higher tendency to bleed |
| Difficult 1| - Very large prostate  
             - Approximately 90 grams  
             - Large median lobe and large side lobes  
             - Heavy bleeding |
| Difficult 2| - Medium-sized prostate  
              - Approximately 60 grams  
              - Medium-sized median lobe  
              - Small side lobes  
              - Heavy bleeding |
Module description
The Laser BPH module offers comprehensive training to acquire all skills necessary to safely perform a complete laser BPH treatment. The module provides a training curriculum relying on self practice until reaching the desired proficiency level. Trainees learn and practice different laser techniques such as vaporization, vaporesection and enucleation. With the Laser BPH Module, urologists can practice their basic skills and perform a full laser BPH procedure on different patient scenarios. The eight cases differ in the size of the prostate, in the bleeding affinity of the virtual patient and in possible complications that may arise. For some patients, a median lobe removal solves the problem; in other cases hypertrophies of both lateral lobes make the intervention more challenging. A morcellation module is available upon request.

Learning objectives
- To establish clear viewing conditions.
- To identify anatomical landmarks and obtain a clear 3D mental image of the anatomy.
- To adjust to the fulcrum effect and 30° angled scope.
- To acquire depth perception and hand-eye coordination.
- To safely handle endoscope and laser fiber.
- To perform vaporization, resection and/or enucleation of the different lobes.
- To control bleeding during the procedure.
- To manage complications with confidence.
- To perform a safety inspection at the end of the procedure.

Instruments
The module requires the endoscope delivered by VirtaMed.
Case descriptions

Abstract median lobe resection
- Median lobe only for easier orientation

Abstract side lobes resection
- Side lobes only for easier orientation

Full procedure – 55g
- Shorter prostate
- Approximately 55 grams
- Large median lobe and normal side lobes

Full procedure – 60g
- Medium-size prostate
- Approximately 60 grams
- Normal median lobe and normal side lobes

Full procedure – 70g
- Shorter prostate
- Approximately 70 grams
- Large median lobe and large side lobes

Full procedure – 80g
- Medium-size prostate
- Approximately 80 grams
- Normal median lobe and large side lobes

Full procedure – 85g
- Large prostate
- Approximately 85 grams
- Large median lobe and normal side lobes

Full procedure – 90g
- Large prostate
- Approximately 90 grams
- Large, very steep median lobe
- Large side lobes
Module description

4 virtual patients with different, multiple papillary and solid bladder tumors offer trainees the opportunity to perform complete TURB procedures in a safe environment without involving patient-related risk. The level of difficulty of the cases differs in the type of the bladder tumors, their location and the intensity of the complications, such as bleedings and risk of perforating the thin bladder wall.

About bladder tumors

There are two different kinds of bladder tumors that are part of the VirtaMed UroSim™ training program: Papillary carcinomas and flat or solid carcinomas. Papillary carcinomas usually have a thin, elongate form and mostly grow from the inner surface of the bladder towards the center. They are often quite easy to remove, as they do not grow into the deeper layers of the bladder, which is why they are called non-invasive papillary tumors. The second type of bladder carcinomas are flat or solid ones. Other than the papillary type, solid tumors do not grow from the surface to the center of the bladder. They grow rather flat and spread around the bladder surface. If those tumors invade the deeper layers of the bladder, they are called invasive transitional cell carcinomas.

Learning objectives

- To inspect the cavity completely and describe visible pathologies.
- To safely remove bladder tumors while avoiding complications.
- To control bleedings.
- To not perforate the bladder wall.

Instruments

The module requires the endoscope delivered by VirtaMed.
Case descriptions

Case 1
- Papillary tumor at the left side
- Solid tumor at the bottom of the bladder

Case 2
- 3 papillary tumors at the bottom and at the back of the bladder

Case 3
- Papillary tumor at the bottom
- 2 solid tumors at the sides of the bladder
- Severe bleedings

Case 4
- Multiple papillary and solid tumors at the top of the bladder
- Severe bleedings