SurgiSkins: Live, Remote Surgical Telementoring with Multi-sensory Clinical Instruction

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Problem

Surgical skills training gap

Can telemedicine bridge this training gap?

Approach

SurgiSkins – Interactive Surgical Video
Telestration + Haptic Simulation

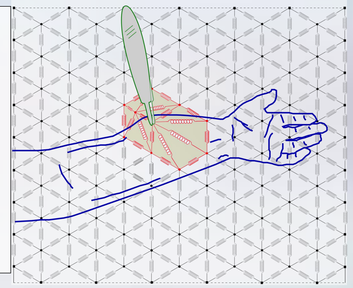
- Surgical video interwoven with computational physics mesh that mimics human tissue response
- Real time ability to superimpose virtual instruments that can:
  - ❖ manipulate
  - ❖ apply tension
  - ❖ virtually cut
  - ❖ virtually suture

→ Live Video

Methods

Three components:

- Virtual mesh
- UV Texture Map
- Virtual Instruments



Cut & Retract

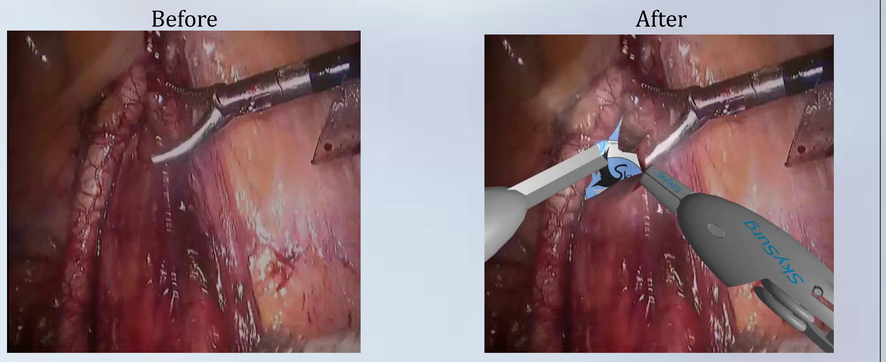


Image of surgical video before (left) and after (right) deployment of SurgiSkin virtual incision and retraction annotation.
Note tissue deformation by retraction from virtual instruments overlaid on the surgical image.

Resect & Suture

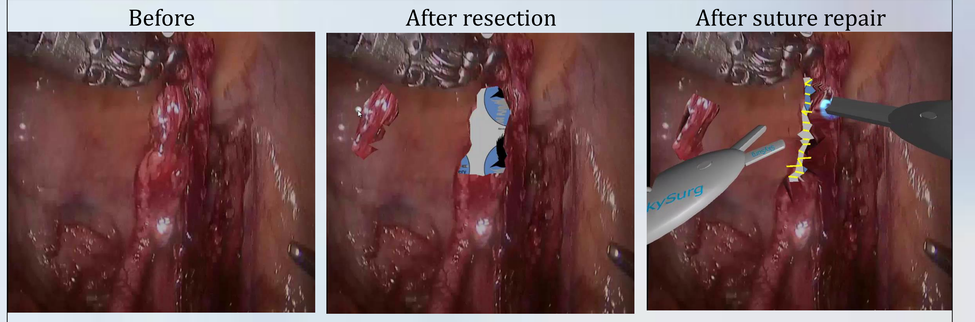


Image of surgical video with SurgiSkins resection and suturing annotation.
Note the flap of resected tissue to top left of virtual forceps.
Note the virtual suturing to demonstrate repair of incision.

Results

- Interactive, live, remote surgical telementoring
- Successful intraoperative telecollaboration during RPLND
- Telementors can remotely demonstrate use of:
  - Forceps
  - Scalpel
  - Suture

Visually describe the *force, direction, and speed* of a maneuver to the operating surgeon in a natural way during a procedure in real time over a standard internet connection.

Conclusion

Collaborative clinical instruction that supports
- pre-operative surgical planning
- intraoperative surgical decision-making
- post-operative clinical review

Faster, Smarter, Better
Accelerate specialist skills acquisition remotely

Disclosure

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