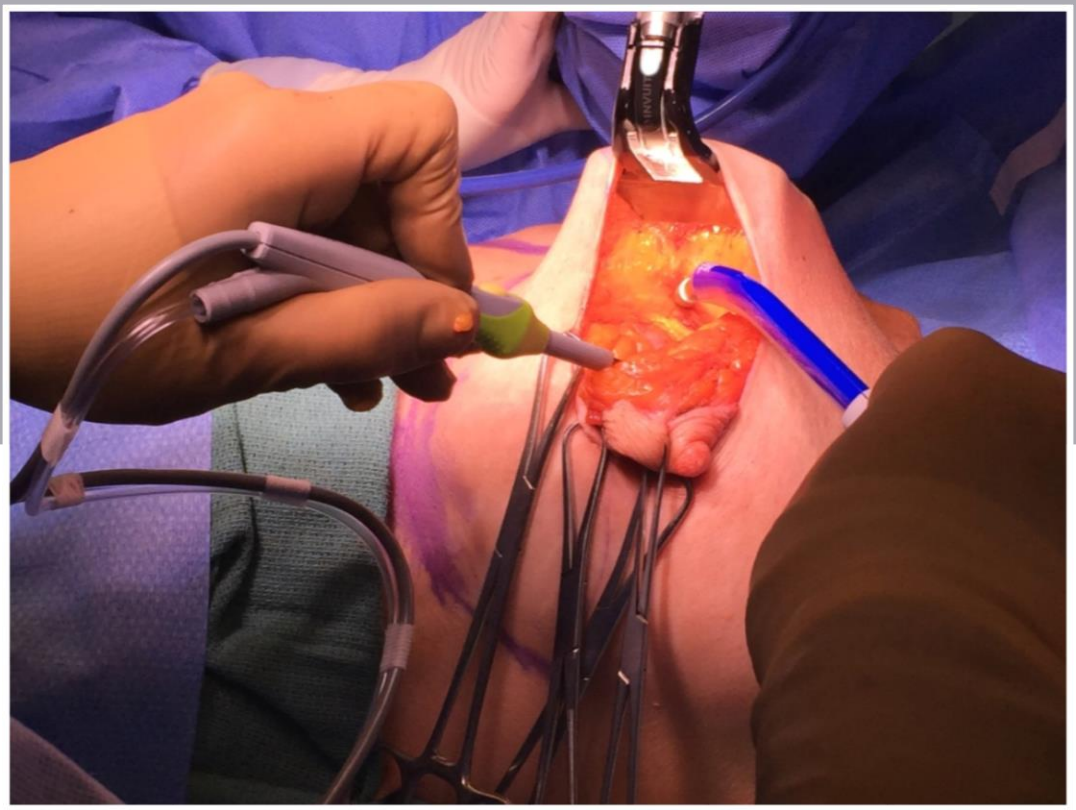
IMPROVED SURGICAL OUTCOMES

Through advanced access and visualization



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CONTINUING EDUCATION CREDITS

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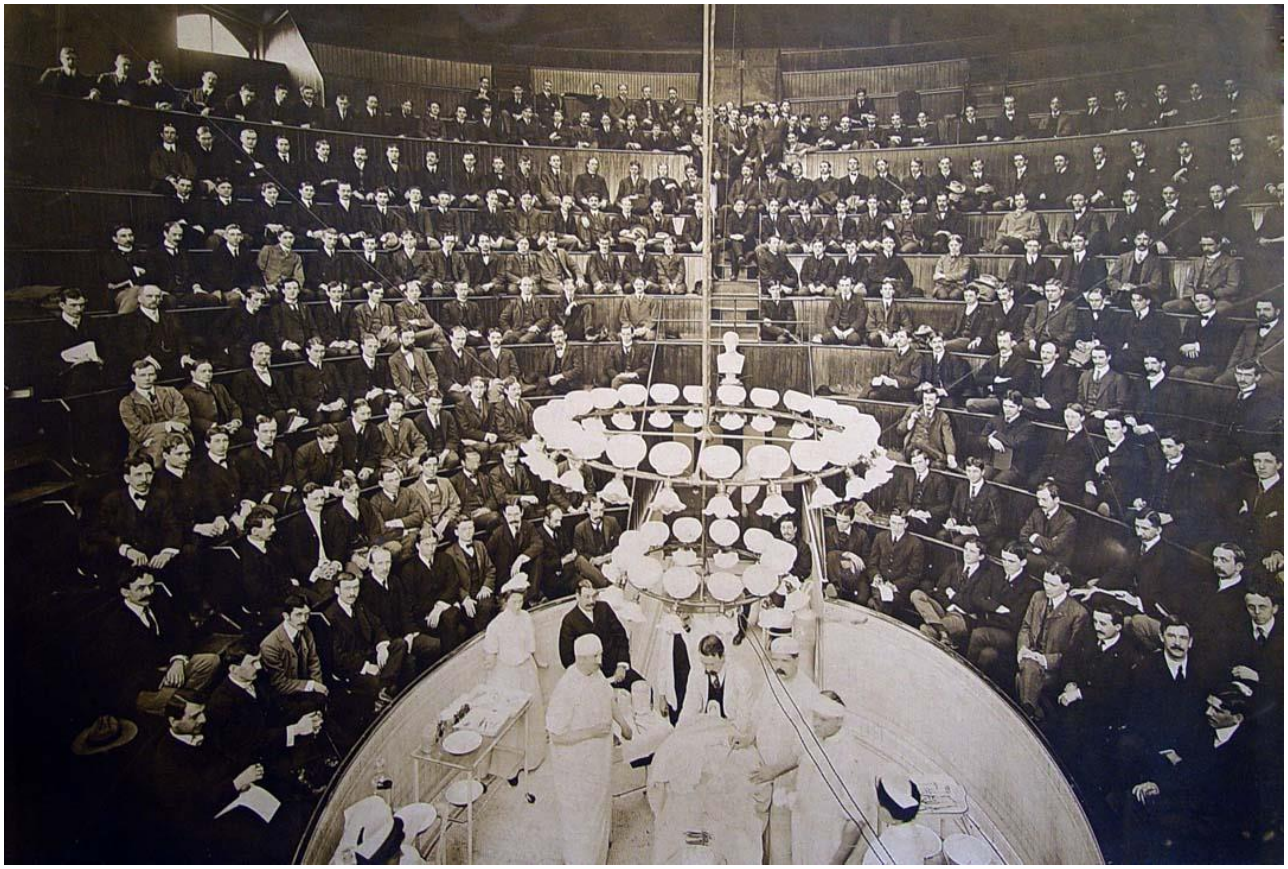
INVUITY® intelligent photonics™

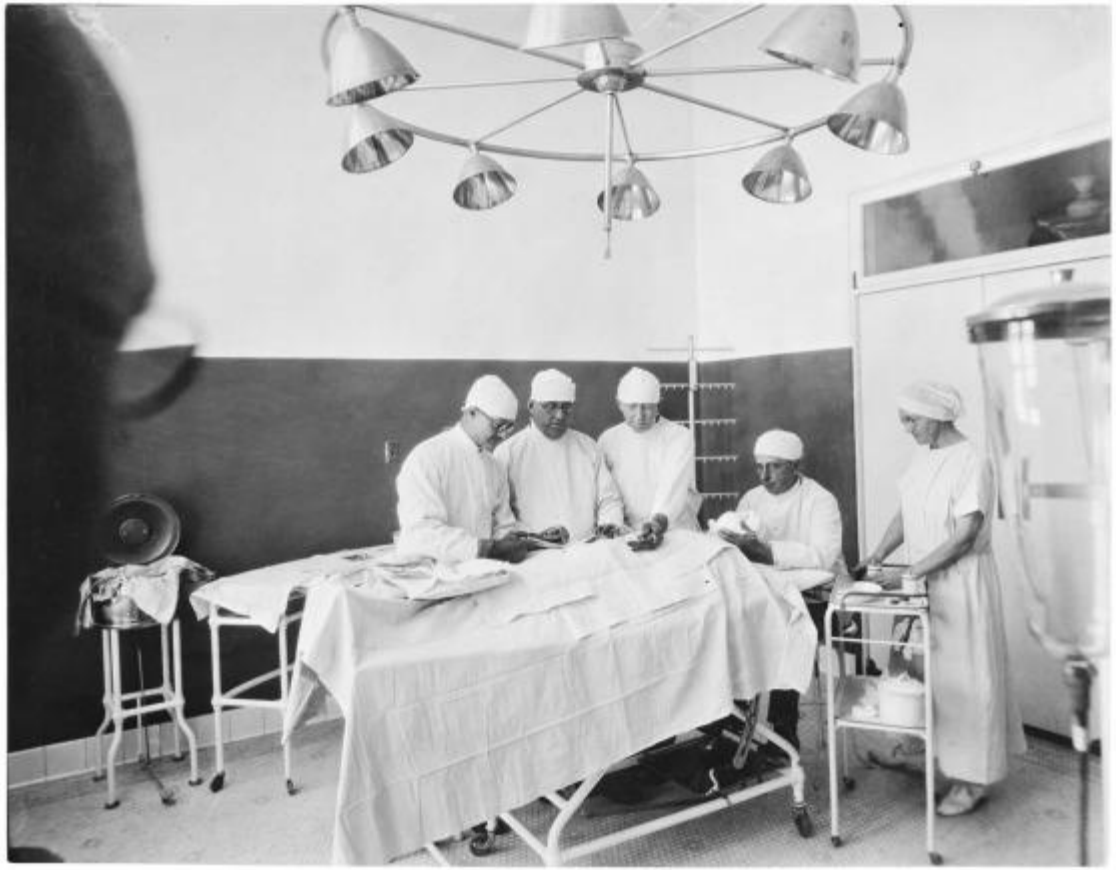
Learner objectives

- Identify the limitations of traditional operating room lighting
- Describe errors and “never events” that can be prevented with advanced photonics technology
- Identify potential safety hazards with electrosurgical equipment in the operating room
- Discuss the advantages of improved access, illumination, and visualization of the surgical cavity during open minimally invasive and minimal access surgery
- Discuss the advantages of non-conductive instrumentation in the operating room environment
- Describe the safety advantages and most common applications of advanced photonics technology

Back in the day



Back in the day



Current limitations with traditional OR lighting

- Constant repositioning of the overhead lights
- Interruptions to tasks
- Potential contamination from headlamps
- Poor visualization
- Burn injuries and surgical fires
- Retained objects
- Inefficiencies and time delays

Traditional OR lighting is ineffective

- Overhead lights
- Headlamps
- LED light sources
- On-field fiber optics

Preventable errors and “never events”

UNINTENDED RETAINED FOREIGN OBJECTS

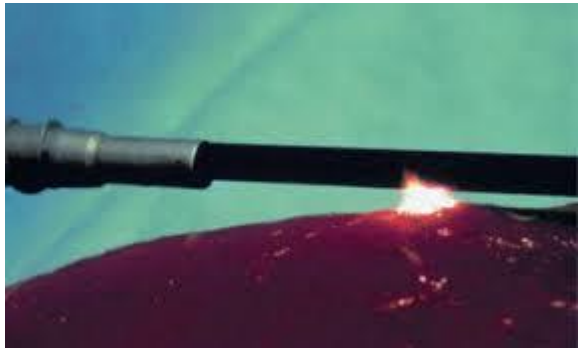
- Most reported Sentinel Event
- Related cost of care $160,000-$200,000
- Considered a reviewable sentinel event by the Joint Commission

SURGICAL FIRES

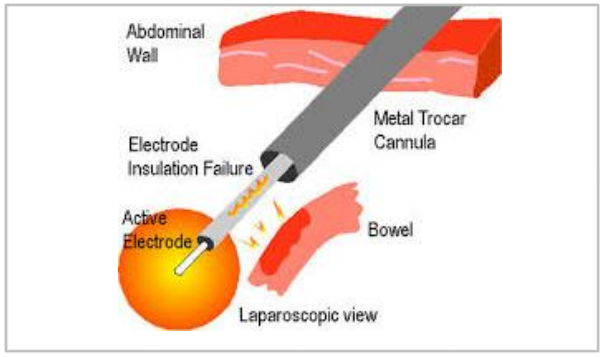
- Not often, but horrendous when occurring

Electrosurgery safety hazards

DIRECT COUPLING



CAPACITIVE COUPLING



INSULATION FAILURE

Complications of delayed diagnosis and treatment of stray electro current

- Organ damage
- Vessel hemorrhage
- Perforation of the small bowel or colon
- Peritonitis

Advanced photonics technology benefits

SURGEON AND FACILITY

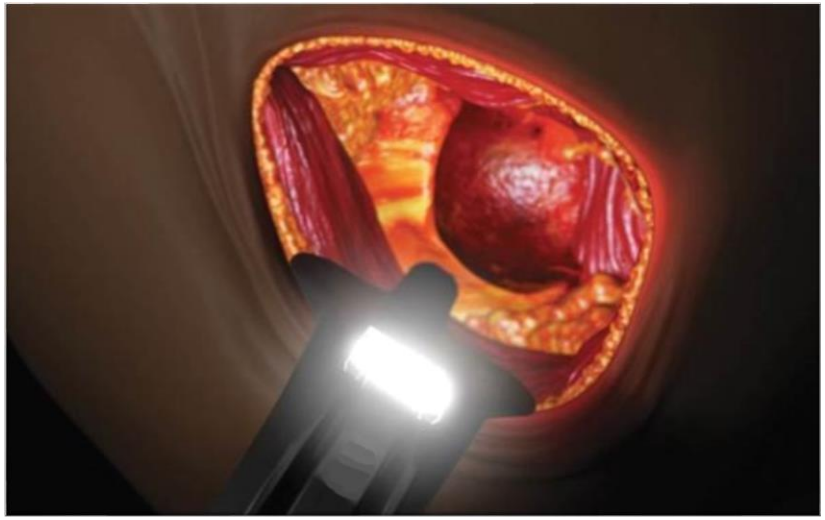
- Precision
- Efficiency
- Safety

Precision for the surgeon and facility

- Delivers improved visualization of tissue planes, critical structures, and anatomical landmarks
- Enables new surgical approaches
- Allows for smaller and fewer incisions

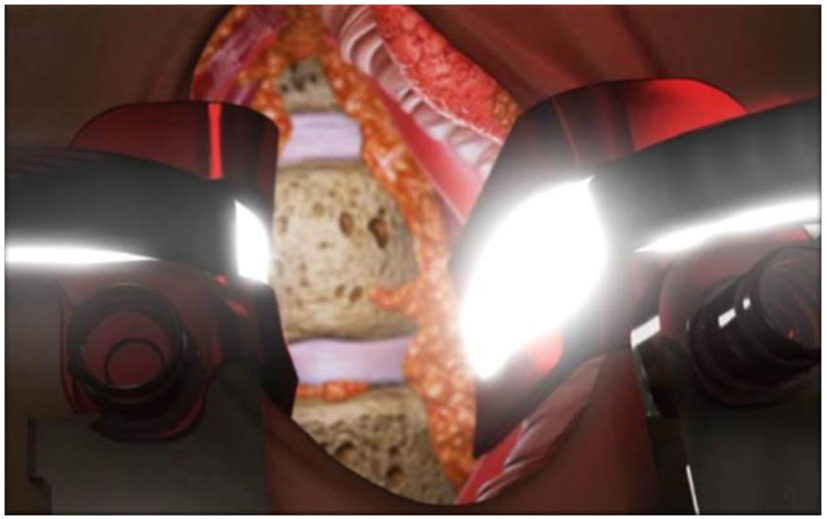
Efficiency for the surgeon and facility

- Improves OR workflow
- Increases surgical efficiency
- Reduces anesthesia time



Safety for the patient, surgeon and staff

Helps avoid “Preventable Errors” and “Never Events”



Safety for the patient, surgeon and staff

The Joint Commission
Sentinel Event Alert

A complimentary publication of The Joint Commission

Issue 51, October 17, 2013

Preventing unintended retained foreign objects

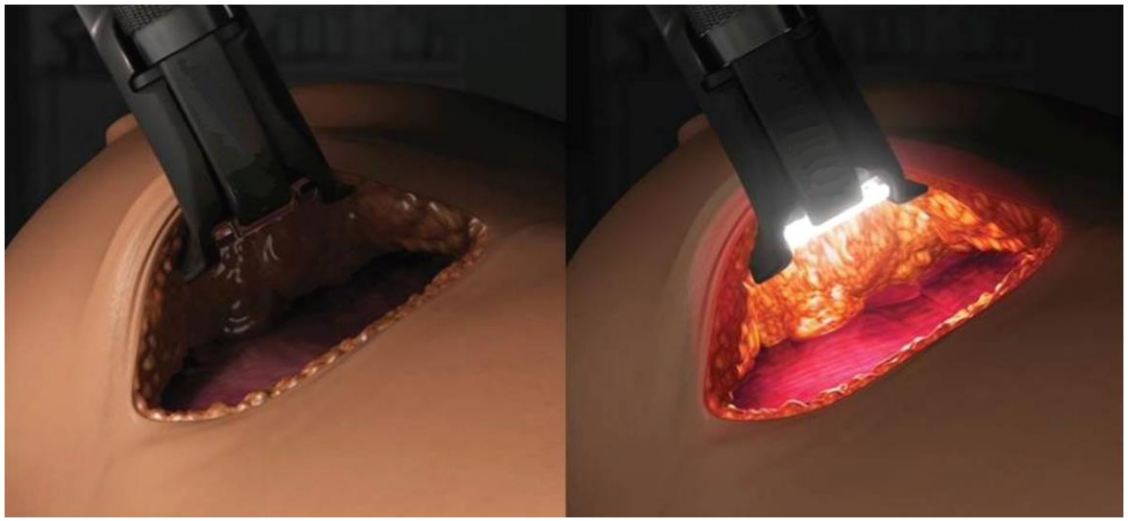
Published for Joint Commission accredited organizations and interested health care professionals, *Sentinel Event Alert* identifies specific types of sentinel and adverse events and high risk conditions, describes their common underlying causes, and recommends steps to reduce risk and prevent future occurrences.

The unintended retention of foreign objects (URFOs) – also called retained surgical items (RSIs) – after invasive procedures can cause death, and surviving patients may sustain both physical and emotional harm, depending on the type of object retained and the length of time it is retained. There may be an extended time frame between occurrence and detection of an URFO. Retained foreign objects are most commonly detected immediately post-procedure; by X-ray; during routine follow-up visits; or from the patient's report of pain or discomfort.

URFOs refer to any item or foreign object related to any operative or invasive procedure that is left inside a patient.[1] Objects most commonly left behind after a procedure are:

Safety for the patient, surgeon and staff

Optimizes visualization deep within the surgical cavity



Safety for the patient, surgeon and staff

Safety for the patient, surgeon and staff

Thermally cool illumination reduces the potential for patient burns and OR fires, virtually eliminating the known thermal hazards associated with traditional fiber optics:

- thermally cool at light cable
- thermally cool at light output
- thermally cool on tissue

Example of technology that does not have thermally cool cable.

Safety for the patient

Reduces potential sources of OR contamination by minimizing overhead/headlight adjustments

Safety for the patient

Design

- Simulated discectomy was performed using 1) headlamps/loupes, 2) operative microscope, or 3) neither, and bacterial shedding was assessed using air sample/settle plate techniques

Methods

- 70 samples from simulated discectomies examined for bacterial growth
  - Group 1 (30 samples) used the operative microscope
  - Group 2 (30 samples) used headlamp/loupes
  - Group 3 (10 samples) used neither as a control.

Results

- Greater than half of the collected samples in Groups 1 and 2 demonstrated bacterial growth with coagulase negative Staphylococcus
- Both groups demonstrated significantly greater number of samples with growth relative to the control Group 3

Conclusions

- The use of headlamps/loupes or the operative microscope is associated with bacterial shedding
- Proper techniques of cleaning, storage, and draping should be used to minimize their contribution to potential postoperative infection

Safety for the patient

Background

- Surgical Microscopes utilize powerful heat-generating light bulbs (typically 300W Xenon), which generate radiant heat on the tissue of the surgical target.
- Intensity of the radiant heat on the tissue increases as the distance from microscope to the tissue decreases
- Microscopes are often used in neurosurgical, spine, urological, otolaryngological surgeries, etc.

Methods

- One case study
- Systematic literature review
- FDA MAUDE database review

Results

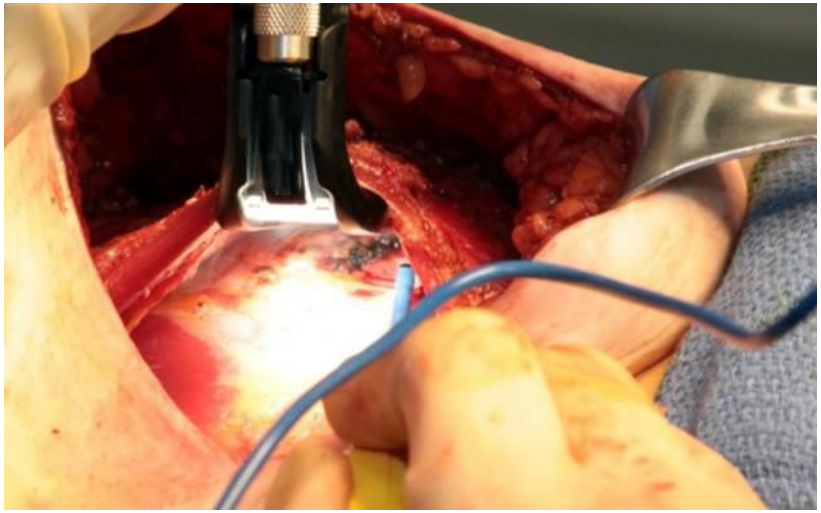
- Case study of iatrogenic microscope burn
- Systematic literature review with iatrogenic microscope burns
  - Most of the iatrogenic burns resulted in 2nd degree burns – few required additional surgery
  - All clinical cases involved xenon-based operating room microscopes
  - 14/14 illuminated at 100 percent light intensity for procedures lasting between 15-180 mins
- FDA MAUDE database review (60 report6s) of iatrogenic microscope burns
  - 40 percent of iatrogenic burns occurred during neurosurgical, 33 percent during otalaryngology and 27 percent during plastic and urology procedures
  - 40 percent resulted in 2nd degree burns, 15 percent in 3rd degree burns
  - Procedure times ranged 30-180 mins
  - 25% reported using illumination intensity of 100 percent, one reported using illumination intensity less than 50 percent

Conclusions

- Iatrogenic skin burns are “Never Events” associated with significant morbidity and liability. While occurrence is rare, it is also is likely under reported.
- Recommended Best Practices:
  - Microscope technique adjustment: (1) utilize low illumination intensity, (2) minimize operative time, (3) use longer focal lengths, (4) minimize use of epinephrine, (5) frequent irrigation
  - Patient risk factors: (1) medication (steroids, local anesthetics w/epinephrine), (2) skin tone, (3) pigmentation

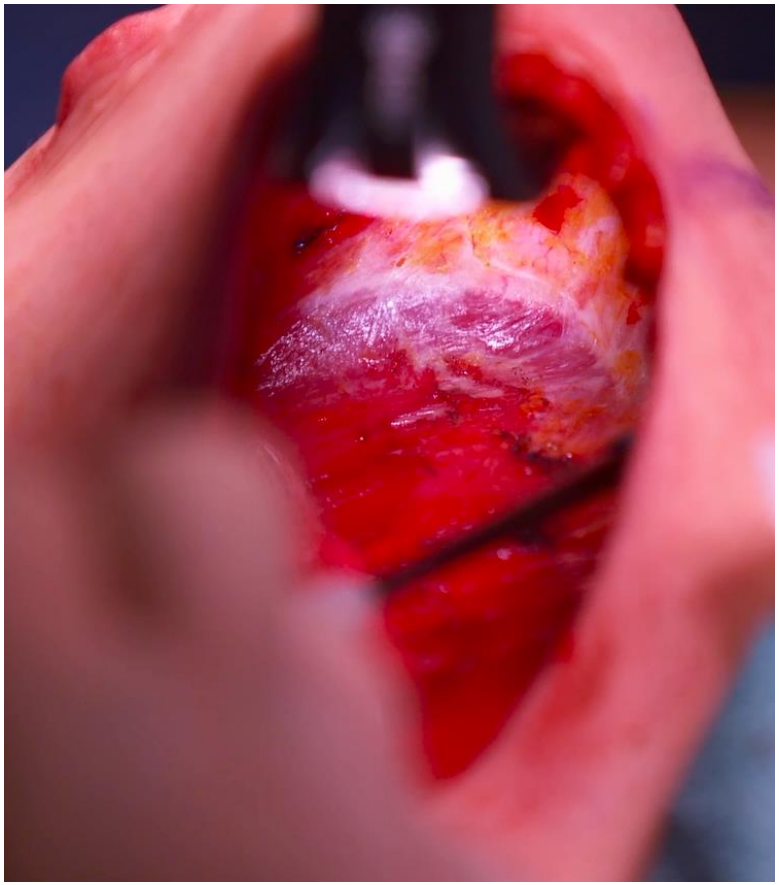
Safety for the patient, surgeon and staff

Non-conductive illuminated retractors eliminate arcing from electrosurgical devices coming in contact with traditional metal retractors



Safety for the patient, surgeon and staff

Improved intracavity illumination and visualization reduces surgeon and assistant fatigue and supports increased surgeon productivity/longevity



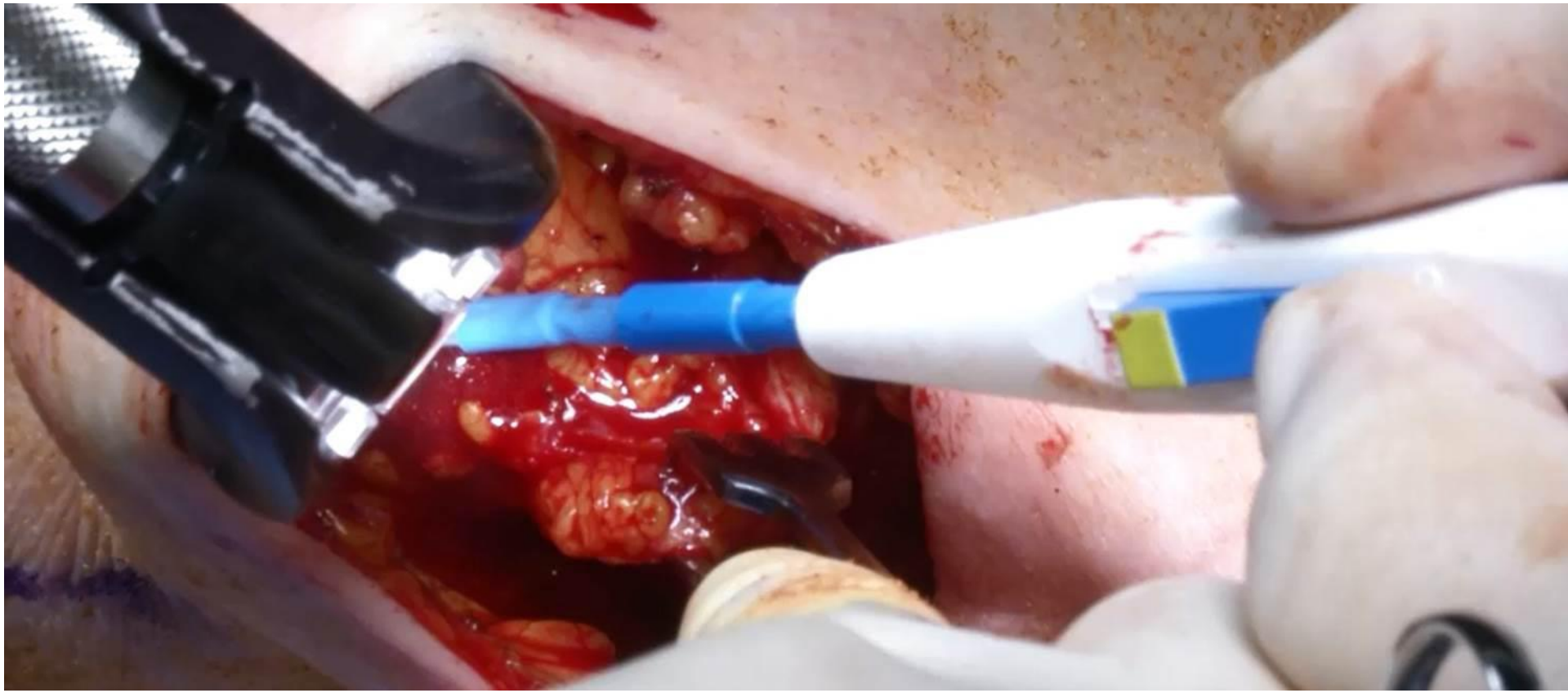
Safety for the surgeon

Abstract

Herniations of the cervical disc in plastic surgeons are far more common in practice than the paucity of reported cases would indicate. A likely explanation may be the peculiar, nonergonomic positions that plastic surgeons must hold during surgery while wearing a headlight and loupes.

From January 2003 to December 2006, at Tri-Service General Hospital, Taiwan, 4 plastic surgeons experienced herniations of the cervical disc. Magnetic resonance imaging study indicated there was disk herniation or bulging with spinal cord impingement. Two plastic surgeons received cervical discectomy, corpectomy with strut reconstruction using titanium cages. These 2 surgeons were symptom-free 2 years after their operations. The other 2 plastic surgeons were under conservative physical therapy with persistent symptoms. The clinical evidence indicated that cervical disc herniation is an occupational hazard in plastic surgeons. To prevent prolonged hyperflexion and twisting of the neck, we proposed wearing a cervical brace during surgery for the plastic surgeons at Tri-Service-General Hospital since January 2008. The results indicated that wearing a cervical brace may be an effective measure to protect plastic surgeons from cervical disc disease.

Advantages of 100% non-conductive instrumentation



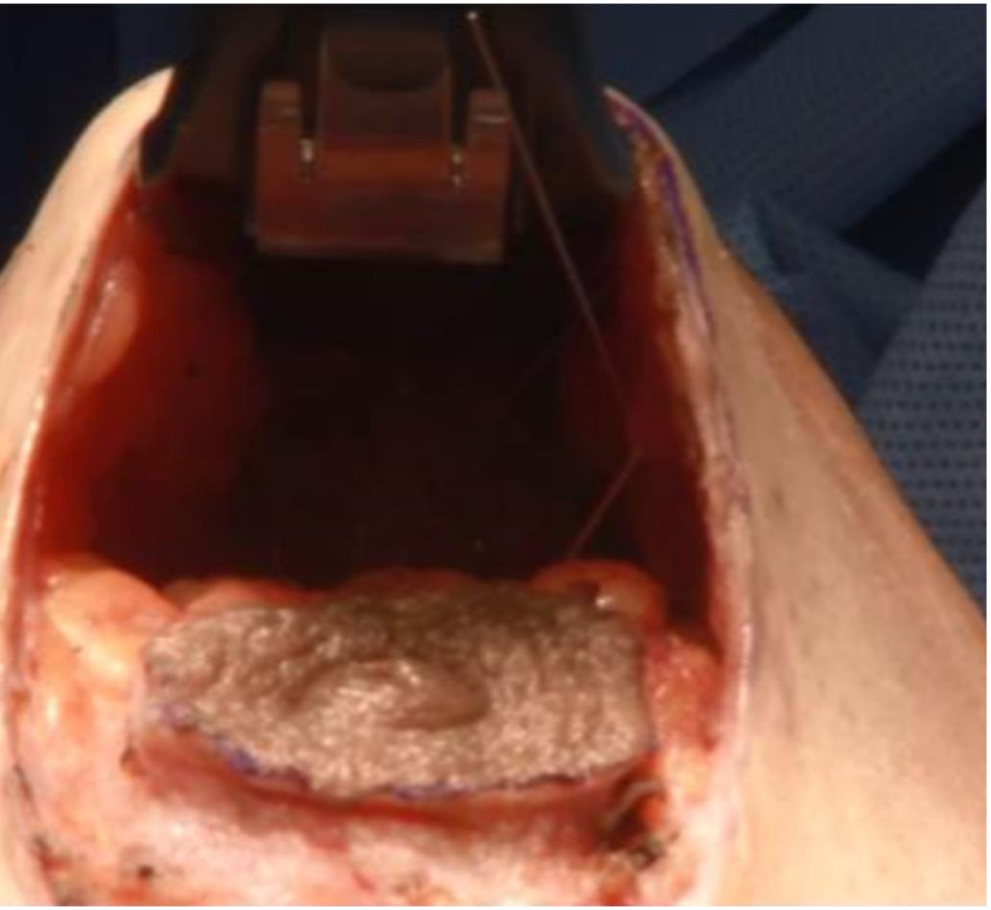
Advantages of non-conductive photonics retractors

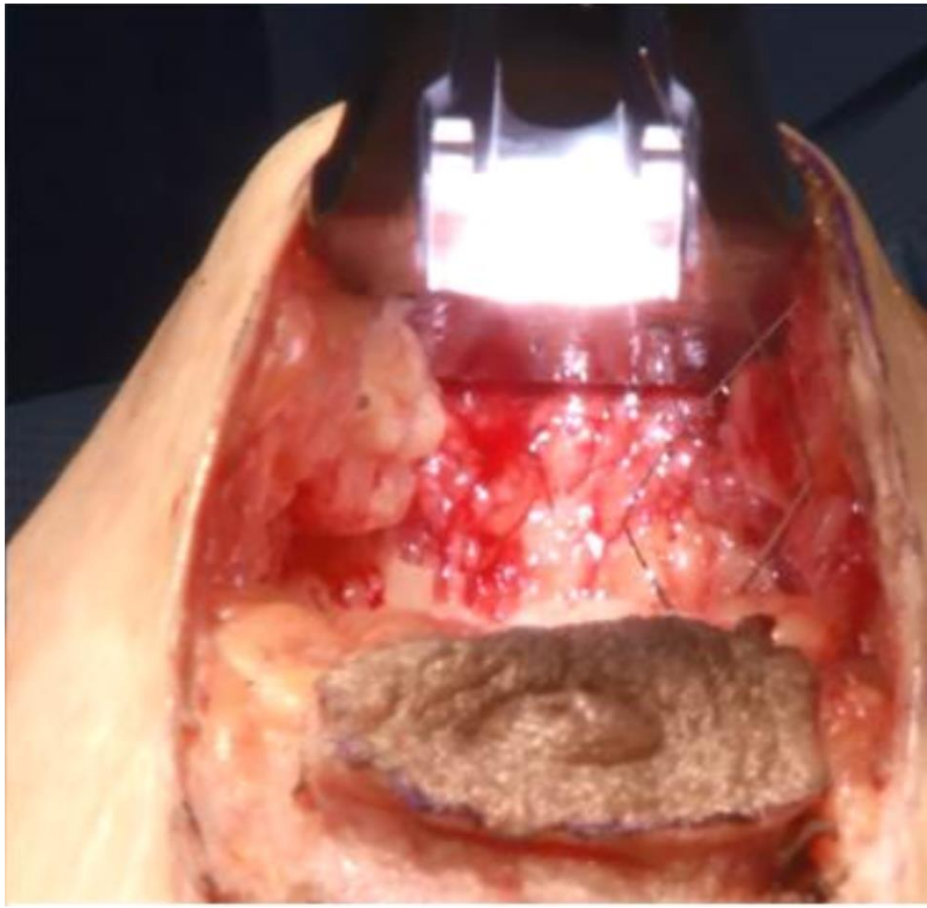
Improved patient safety by eliminating the potential for burns due to arcing from electrosurgical devices when coming into contact with traditional metal retractors

Common applications for advanced photonics technology

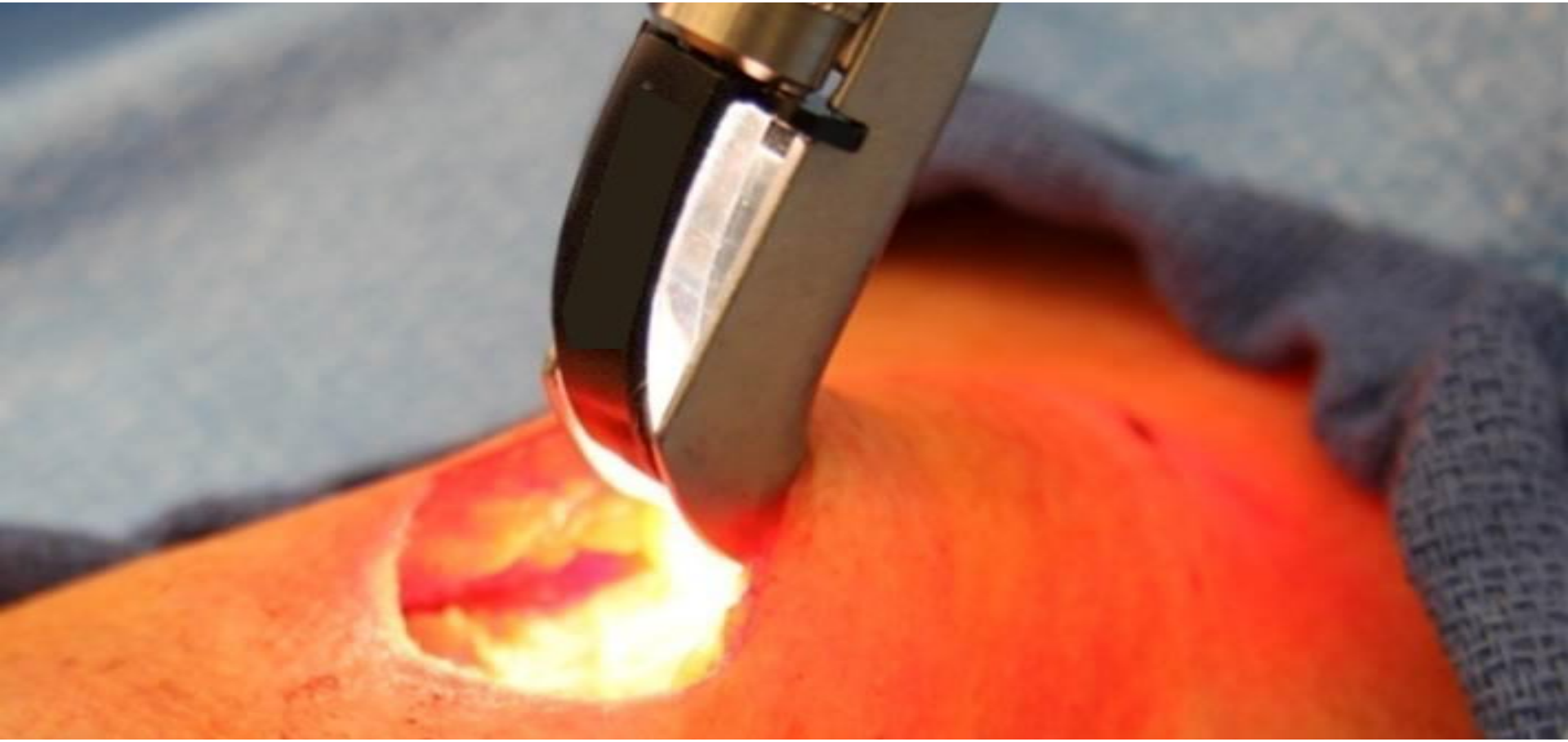
- Generalized surgery
- Breast oncologic surgery and reconstruction
- Plastic reconstructive surgery
- Thyroid oncologic surgery
- Spine surgery
- Orthopedic surgery
- Gynecologic surgery
- Cardiac / thoracic surgery

BREAST ONCOLOGIC SURGERY



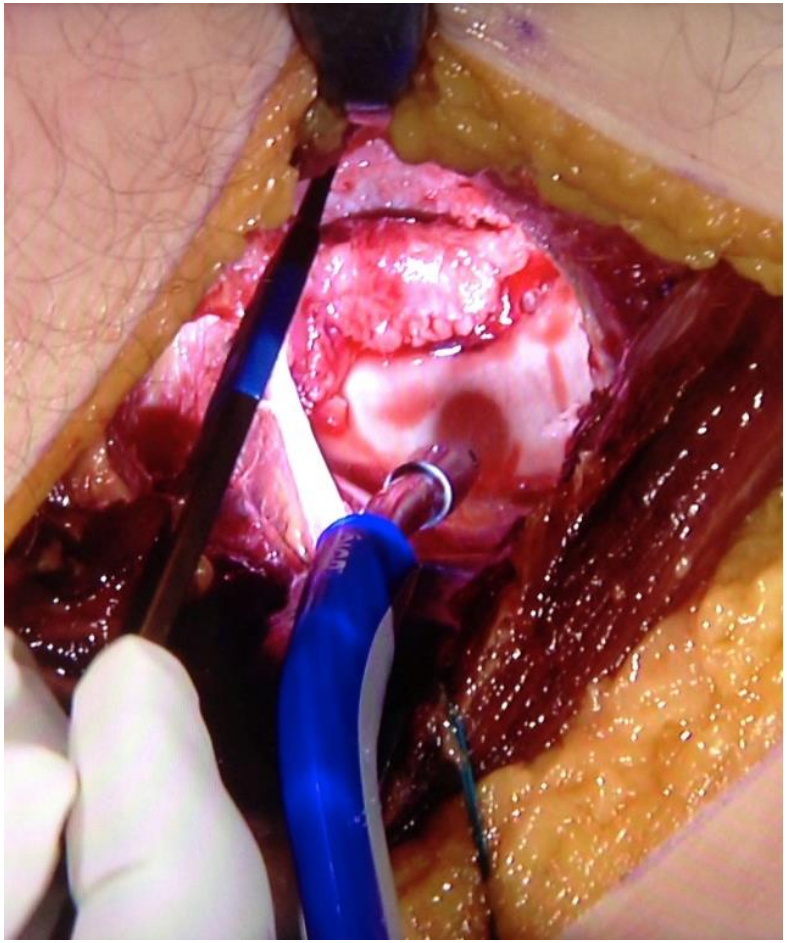


THYROID ONCOLOGIC SURGERY

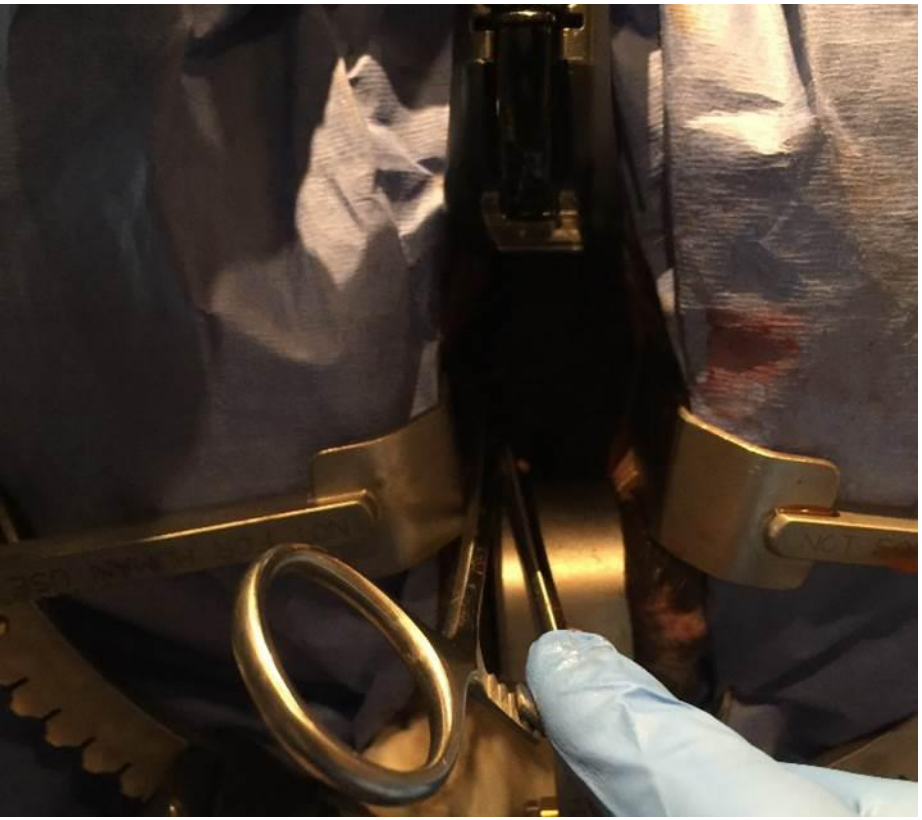


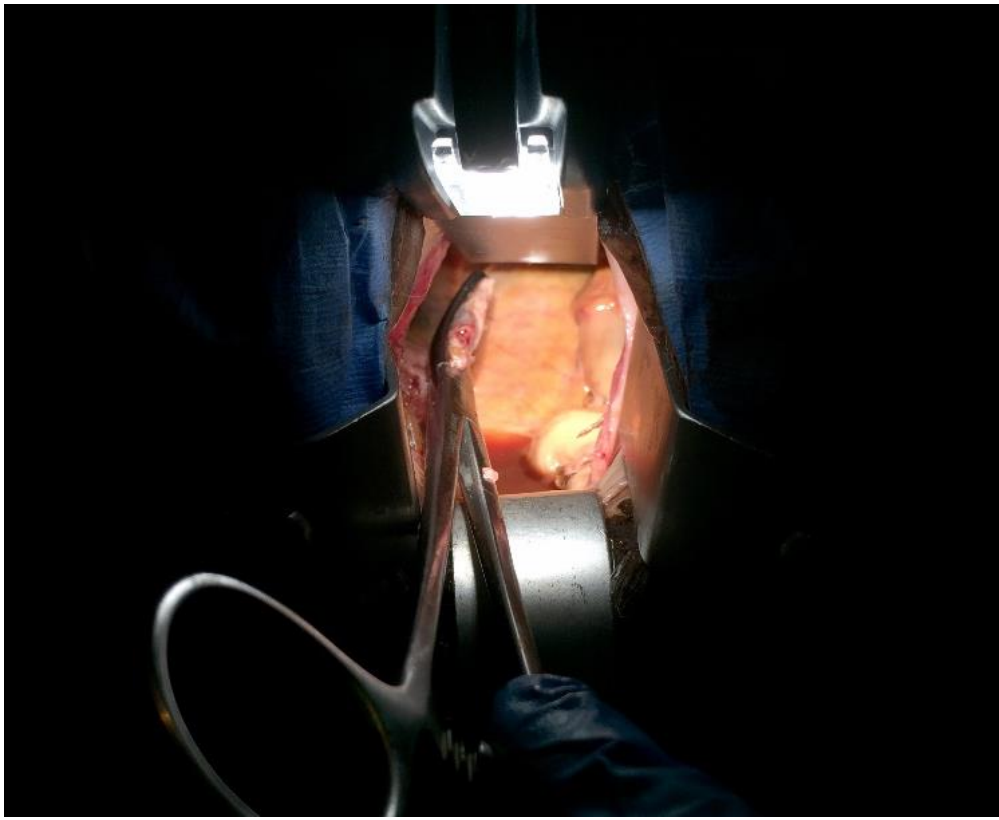
SPINE SURGERY

ORTHOPEDIC SURGERY

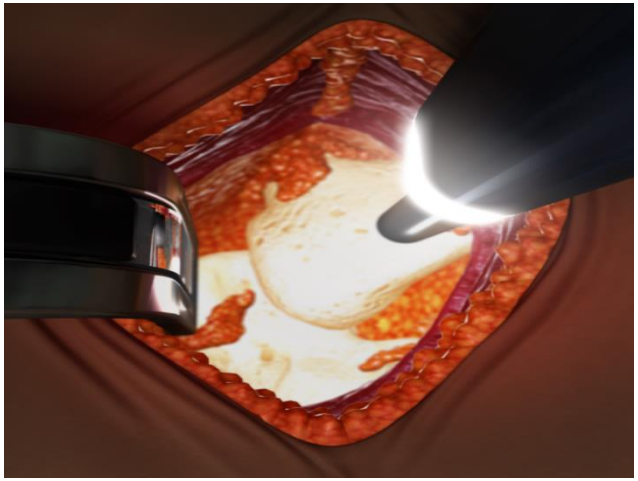


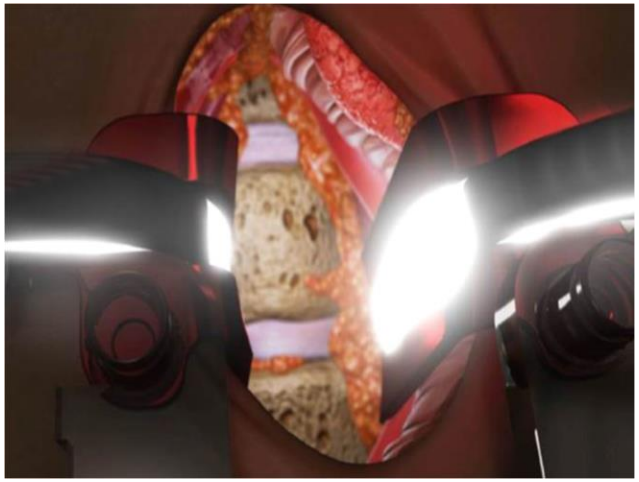
GYNECOLOGIC SURGERY





Summary





Summary

- Limitations with traditional OR lighting
  - Poor visualization, potential thermal hazards, operating inefficiencies and time delays, and potential contamination risk
- Advanced photonics can help reduce preventable errors and never events
  - URFO's and surgical fires
- Potential safety hazards with electrosurgical equipment include:
  - Direct coupling, capacitive coupling, and insulation failure
- Superior intracavity visualization enables surgical precision, efficiency and safety
- Advantages of non-conductive instrumentation in the OR
  - Improved patient safety by eliminating the potential for burns due to electrosurgical arcing
- Advanced photonics technology can be utilized across many surgical specialties and procedures

Questions?

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- Please be sure to return your registration and evaluation forms to your presenter
- Certificates of Attendance for this course are available in your course booklets
- Please keep this for your records