

# Bone cancer surgical team sees success in new application of surgical aid

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An ortho-oncology team at Dartmouth-Hitchcock Norris Cotton Cancer Center successfully adapted a shoulder surgical aid (the Spider Limb Positioner) to conduct a left hip disarticulation on a melanoma patient as described in a case report published online in *Medical Devices*.

The Spider Limb Positioner is a pneumatic arm with three fully articulating joints that can be infinitely adjusted in relation to the operating table where it is mounted. The positioner mobilizes patients' limbs so surgeons don't have to, thereby freeing up both their hands to operate. The device is usually used at Dartmouth-Hitchcock Medical Center to place patients in beach chair position (upright and slightly recumbent), during shoulder surgery. The connection bar is normally outfitted with a soft, disposable arm cuff to hold and stabilize a lower arm.

In order to treat a melanoma patient, Eric Henderson, MD, an assistant professor at Dartmouth's Geisel School of Medicine and orthopaedic surgeon at Dartmouth-Hitchcock Medical Center, modified the connection bar to accommodate a leg.

The task of holding heavy limbs in awkward positions for long periods of time leads to fatigue and increased operating room staffing. Existing limb positioners don't have the flexibility and fluidity to support easy repositioning. The Spider Limb positioner has a pneumatic arm controlled via a sterile pedal.

The 64-year old patient had melanoma on the third left toe, which had spread to his shin bone. The tibia tumor had broken through the skin and developed into a leaking, infected wound classified by Henderson as fungated and superinfected. This advanced metastasis had not responded to aggressive chemotherapy. When the man showed symptoms of early sepsis, the patient and family decided to proceed with amputation in hopes of a cure. Imaging tests showed the cancer was confined to the leg.

Henderson prepared to use the Spider Limb Positioner for a hip disarticulation. Instead of the arm cuff, the surgical team applied a short leg cast to the patient and then adhered it using fiberglass directly to the arm holder. Henderson needed a wide surgical view to transect the muscles, ligaments, and blood vessels of the hip and then to navigate the sciatica nerve. The leg was positioned and adjusted frequently to maintain the best view of the surgical field.

"The operation was a success because the patient's electrolyte levels were able to be controlled because he no longer had a large tumor releasing factors stimulating his organs to release large amounts of calcium," said Eric R. Henderson, MD, who heads up the sarcoma program at Norris Cotton Cancer Center. "His infection was also controlled and he was more comfortable."

Since the Spider Limb Positioner increased exposure and reduced strain in this lower extremity surgery, Henderson wrote that the device could offer patient care benefits for orthopaedic trauma and oncology surgeons. Henderson's team has conducted two hip disarticulations with the device.

Provided by The Geisel School of Medicine at Dartmouth

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