

# Use of a novel energy technology for arresting ongoing liver surface and laceration hemorrhage

Chad G. Ball, MD, MSc

From the Regional Trauma Program,  
University of Calgary and the Foothills  
Medical Centre, Calgary, Alta.

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**Correspondence to:**  
C.G. Ball  
Foothills Medical Centre  
1403-29 St. NW  
Calgary AB T2N 4W4  
ball.chad@gmail.com

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## SUMMARY

Persistent hemorrhage from liver capsular injuries has remained a technical challenge without an optimal solution. This report discusses an easy to use device that is commonly used within elective hepatic surgery and can be successful in arresting ongoing surface and laceration bleeding in patients with solid organ injuries.

**H**epatic hemorrhage is often life-threatening and difficult to arrest. While the algorithm for the treatment of ongoing liver bleeding is well described,<sup>1</sup> technical considerations for stopping persistent hepatic surface/capsule bleeding are not. Traditional techniques include coagulation by high voltage cautery using a Bovie, topical hemostatic application and/or the delivery of ignited argon gas.<sup>2</sup> This form of bleeding is particularly troublesome when a surgeon unpacks a previously damage-controlled liver injury that had not been wrapped with a nonstick, plastic barrier.

Several patients (11) at the Foothills Medical Centre (FMC) have now been treated with a novel device that is commonly used for elective liver transection among hepatobiliary surgeons (Aquamantys; Medtronic). This instrument utilizes bipolar radiofrequency energy, which acts to ignite/boil dripping saline from a small, easy to manipulate handpiece instrument. This device is also excellent at sealing small to medium-sized bile ducts, thereby preventing subsequent bile leaks and collections.

The 11 patients treated at FMC had multiple injuries (mean injury severity score 28) and required initial damage control packing with a return to the operating room within 24–72 hours once their physiology and biochemistry was stabilized. All livers had been initially packed with standard laparotomy sponges and subsequently oozed substantial volumes of blood from the liver capsule and/or laceration itself when unpacked. Coagulation and cauterization with the Aquamantys device stopped the hemorrhage in all 11 patients immediately. Anecdotally, the local effect of the Aquamantys device on the injured liver and associated hemorrhage was very similar to its effect during elective surgery on cirrhotic patients. In all cases, the 6.0 tip (round and blunt), as opposed to the 9.5 tip (sharp), was used. Interestingly, surgeons at FMC have also successfully used its deep tissue sealing ability for a splenic laceration in 1 patient with multiple injuries.

The Aquamantys instrument has the potential to arrest ongoing hepatic surface/capsular bleeding as well as moderate hemorrhage associated with the liver laceration itself. Despite an impressive history and near ubiquitous use within the elective hepatic surgery arena, to my knowledge, this represents the first discussion of a potential use for this technology in injured patients. Further experience and study is required.

## References

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