Military Surgeons Favor Hemostatic Dressings Over Gauze

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WASHINGTON — Gauze deserves to be permanently retired in favor of more effective wound fillers and hemostatic agents, according to several presenters at a meeting cosponsored by the American Academy of Orthopaedic Surgeons and the Orthopaedic Trauma Association.

Col. John Holcomb, MC, USA, of the U.S. Army Institute of Surgical Research at Fort Sam Houston, Tex., discussed his experience with HemCon dressing (HemCon Medical Technologies Inc.). HemCon contains the hemostatic agent chitosan and was approved by the Food and Drug Administration in 2003. Although chitosan is derived from purified shrimp shells, it is a filler in many cosmetics and food products and thus is unlikely to cause an allergic reaction, even in people with seafood allergies.

He presented preliminary data from a survey that he and his colleagues sent to military medics, physician assistants, and nurses regarding their use of this dressing in combat injuries. There were 48 uses of HemCon, 4 of which were duplicative. Of the 44 included cases, 29 followed gauze failure. Of those, the HemCon succeeded in controlling the bleeding 100% of the time. In 42 of all 44 included cases (95%), HemCon either improved hemostasis or stopped the bleeding entirely, said Dr. Holcomb, an ACS Fellow.

These data are similar to those he and his colleagues published last year for an uncontrolled case series of 68 patients, where use of HemCon achieved hemostasis in 97% of cases (J. Trauma 2006;60:655-8). The responding medical personnel “thought this was useful in places where tourniquets didn’t work and useful after gauze had failed.”

Preventing exsanguination for large wounds is especially important in the current war in Iraq, where Dr. Holcomb said the increasing use of roadside bombs has led to more wounds that are hemorrhagic. “I think injuries are worse now than they were 3 years ago,” he said. He noted that HemCon is now included in all Army first-aid kits, as well as in Army ICUs. Another brand of chitosan-based hemostatic bandage is ChitoFlex (North American Rescue Products Inc.).

In addition to stopping bleeding in extremity wounds, Dr. Holcomb said that HemCon also does so in wounds to internal organs, notably the bowel and the kidney, though this use is off label. One caveat he offered is that when the dressing is removed, the wound may present the appearance of infection despite being sterile. “It doesn’t look very good when you take it out,” he said.

Also commonly used in combat injuries is the hemostatic dressing QuikClot (Z-Medica Corp.), a granular wound filler that eventually is washed out of the wound. Capt. Peter Rhee, MC, USA, director of the Navy Trauma Training Center, Los Angeles, discussed off-label uses of the product.

He presented prepublication data from a group of civilian and military medical personnel regarding their use of QuikClot. Of 103 cases, 95 (92%) showed efficacy in stopping the bleeding. There were 34 cases treated by civilian personnel, and 69 cases were treated in a military setting. Dr. Rhee, an ACS Fellow, also reported his own experience in using the product off label to treat a chest wound. He noted that the patient, who survived, would otherwise have died. He disclosed no potential conflicts of interest.

Maj. Martin Schreiber, MC, USA, in a presentation discussed the merits of fibrin dressings, which contain fibrin and/or thrombin.

Tisseel VH (Baxter International Inc.), the first such product to be approved by the FDA, requires 20 minutes of warming and stirring before it can be applied. FloSeal (also from Baxter) is a gelatin matrix derived from bovine collagen; unlike Tisseel, it does not require heating before mixing. Evicel (Omnix Biopharmaceuticals) is made from human fibrinogen and thrombin and requires no mixing. This product can be stored up to 2 years if frozen. Evicel can be used in liver resection surgery when standard hemostatic techniques have failed, said Dr. Schreiber, director of surgical critical care at Oregon Health and Science University, Portland, and an ACS Fellow.

Not yet approved by the FDA is dry fibrin-sealant dressing, developed by Dr. Holcomb and the Red Cross. This product is made from lyophilized human thrombin and fibrinogen from blood donors, as well as calcium chloride, contained in a synthetic mesh. The dry fibrin-sealant dressing has been used in one combat victim (for whom clinical data were not presented), but several animal studies by Dr. Holcomb and colleagues have shown a reduction in blood loss and better overall survival, compared with gauze—including in animals with grade V liver injury (J. Trauma 1999;46:49-57).

“The emphasis has really turned from resuscitating patients to stopping hemorrhage. What we’re seeing really is an explosion in the field of the technology of the various hemostatic [agents],” Dr. Schreiber said. On that point, Dr. Holcomb noted that whichever hemostatic dressing is chosen for use in the emergency department, “they are all better than gauze.”