PIPE INSULATION AS A PROTECTIVE DEVICE FOR ELBOW WOUNDS IN DOGS
Michael M. Pavletic, DVM, DACVS
Head, Department of Surgery
Angell Animal Medical Center, Boston, Ma.

Key Points

- Closure Options for Elbow Wounds
- Elbow Protection Options
- Prolong Protection using P.I.P.E

Difficulties in closing skin wounds overlying the olecranon in dogs is largely due to this region’s susceptibility to repeated impact and compression. Wound closure under excessive tension is an invitation to dehiscence. This is particularly evident in large breed dogs where their body weight can enhance these two factors. Wounds in this region may be secondary to external trauma, prolonged compression of the skin with tissue ischemia (pressure sores), infection/abscessation, or dehiscence secondary to resection of diseased or damaged skin. Debilitated dogs are more prone to pressure sore formation secondary to prolonged recumbency in one position. Once formed, long term resolution of pressure sores can be problematic without optimum nursing care.

Closure techniques for elbow wounds include a.) healing by second intention, b.) simple appositional closure of the wound, c.) local skin flaps, d.) axial pattern flaps, e.) myocutaneous flaps, f.) distant direct flaps, and g.) skin grafts. Each option has advantages and disadvantages.

Successful closure of these cutaneous defects normally includes a variable period of time protecting the area from external disruptive forces. A variety of external protective techniques, commercially available protective devices, and bedding materials have been advocated to both prevent trauma to the olecranon region and promote the closure of problematic skin wounds. They include: external splints/spica bandages; Schroeder-Thomas splints; antecubital braces to prevent elbow flexion; “doughnut” rings (comprised of cotton or short segments of pipe insulation); and soft bedding, including sheep-skin and foam mattresses. Soft bedding is usually used as a form of supplemental protection of the olecranon area, rather than a primary method of managing elbow wounds. Each of the current protective devices noted has their own advantages and limitations. Prolonged protection of the elbow into the maturation phase of healing may be of special importance in the larger canine patients.

The author believes that skin used to cover the olecranon is especially susceptible during this proliferative phase of healing: impact or prolonged compression of the relatively immobile skin increases the possibility of focal skin necrosis. Moreover, the blood supply to the skin, in the early stages of healing, may be marginal. Therefore, incisional healing, at the point where skin sutures can be removed, is not the ideal guideline for abandoning protective devices for the olecranon area.

This lecture describes a new external device designed to protect the elbow after the surgical closure of wounds overlying the olecranon, while allowing the dog to walk on the affected leg unimpeded. Composed of commercially available foam pipe insulation (Armacell), layered application of this material provides a protective cushion to the elbow. Pipe insulation protection for elbows (P.I.P.E.) allows for prolonged protection of the olecranon area postoperatively.
Pipe insulation is used by plumbers and homeowners to insulate water pipes. There are a few varieties available at hardware stores. Black plastic foam pipe insulation (Armacell Self Seal Pipe Insulation, Home Depot) is a soft, light, flexible foam, with a linear split to facilitate its application around a pipe. Properly layered and secured to the limb, the dog can use the leg unimpeded over extended periods of time. The PIPE can be changed every 3 weeks and used (usually) for a minimum 6 week period.

As discussed, both spica splints and the Schroeder-Thomas Splints provide relatively effective immobilization of the elbow, but with the unfortunate loss of limb usage. Their use could be considered, at least initially, if there is significant skin tension on the incision after wound closure. After incisional healing, P.I.P.E. could be used to replace the splint when prolonged protection is advisable.
