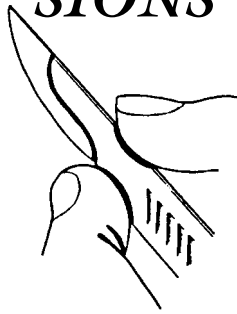


DIMENSIONS IN SURGERY



by SCOTT ANDERSON, DVM, Diplomate of the American College of Veterinary Surgeons, Diplomate of the American College of Veterinary Emergency and Critical Care, Diplomate of the American Board of Veterinary Practitioners
PHIL GILL, DVM, Diplomate of the American College of Veterinary Surgeons
LARRY LIPPINCOTT, DVM, Diplomate of the American College of Veterinary Surgeons
MARY SOMERVILLE, DVM, Diplomate of the American College of Veterinary Surgeons
SHARON SHIELDS, DVM, Diplomate of the American College of Veterinary Surgeons
RAVIV J. BALFOUR, DVM, Diplomate of the American College of Veterinary Surgeons
ERIN WILSON, DVM, Staff Surgeon

Dimensions in Surgery is now in its 18th year.

Ulnar Osteotomy

EMPHASIS:

Forelimb growth deformities are most commonly a result of an irreversible injury to the germinal cells of the physis resulting in premature physal closure. This is a Salter-Harris Type V injury. Because the radius and the ulna are paired bones and have codependent growth, premature closure of a physis of one bone can lead to abnormal growth of both.

The distal radial and ulnar physes are responsible for most of the bone length with the distal radial physis determining 60% of radial length and the distal ulnar physis determining 85% of ulnar length. The distal ulnar physis is more commonly injured and when prematurely closed can result in shortening of the ulna and radius, cranial bowing of the radius, valgus angulation and external rotation. Elbow and carpal incongruity commonly result.

Young patients with radiolucent physes still have growth potential and should be treated with ulnar osteotomies until they reach skeletal maturity. The osteotomy will effectively release the radius so that it can continue to grow more normally.

Depending on the age of the pet and the degree of deformity persisting at skeletal maturity, definitive curvature correction may be necessary. These patients often require a radial wedge osteotomies and stabilization. Most skeletal growth occurs

between the 4th and 6th months, with some continued growth until 10 months of age.

PREOPERATIVE DIAGNOSTICS:

1. Physical Examination
2. Orthopedic examination
 - a. Gait evaluation
 - b. Assessment for patient discomfort
3. Minimum data base: CBC, serum chemistry profile and urinalysis
4. Radiography: Craniocaudal and lateral views of both forelimbs, from the elbow to the paw, to evaluate for joint incongruity and length disparity

PREOPERATIVE CARE:

1. Indwelling IV Catheter.
2. Intravenous induction protocol (e.g. propofol, ketamine/diazepam, etc.)
3. Endotracheal tube intubation and inflate cuff.
4. Isoflurane inhalant anesthesia to effect.
5. Lead II ECG and pulse oximetry

during patient preparation and surgery.

6. Circumferentially clip and prepare the affected limb from just above the elbow to the metacarpal pad.
7. Clip and prepare a 6 cm square area over the ipsilateral flank for fat graft.
8. Cefalexin 22 mg/kg IV immediately prior to surgery.
9. Place dog in lateral recumbency with affected leg suspended.

SURGICAL PROCEDURE:

1. Place sterile impermeable stockinette around foot and drape off the forelimb.
2. Drape off the flank.
3. Make a 4-5 cm caudolateral approach over the mid to distal one-third of the ulna.
4. Separate lateral digital extensor muscle from extensor carpi ulnaris to expose the distal ulna.
5. Elevate surrounding musculature to isolate the ulna just proximal to the physis (See Figure 1).

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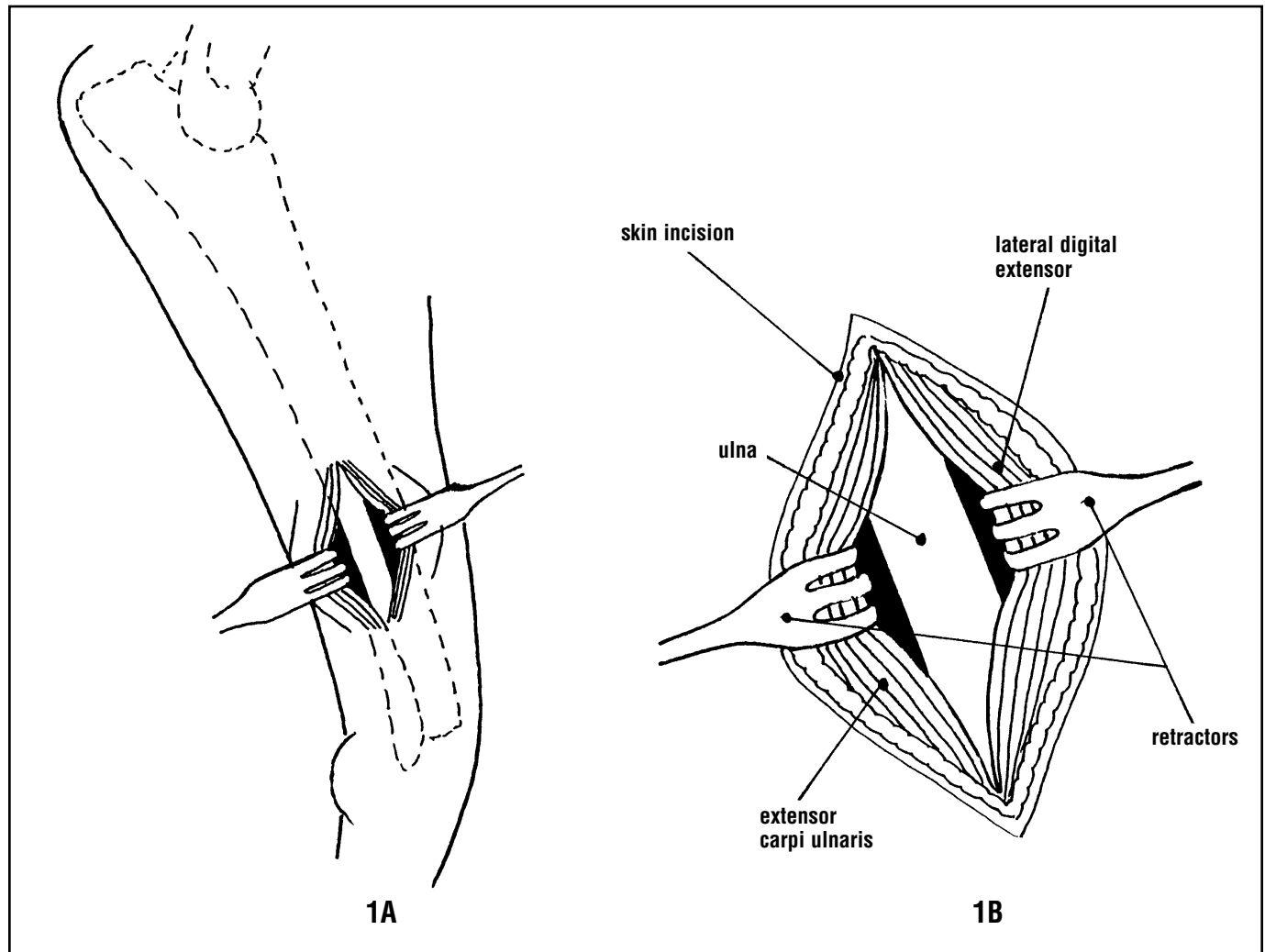


Figure 1: This schematic drawing depicts the lateral aspect of the left forepaw just above the physis of the distal ulna: **1A)** This overall leg view orients the surgeon to the surgical site. **1B)** This surgical dissection shows the ulna ready for osteotomy.

- Excise a 2 cm section of bone using an oscillating saw, Gigli wire or osteotome and mallet (See Figure 2).

AXIOM: Be sure to remove all of the periosteum at the osteotomy site.

DANGER:

Ulnar osteotomy proximal to the interosseous ligament can lead to elbow instability and may need stabilization with an intramedullary pin.

DANGER:

Incision into the interosseous artery is common. Hemostasis with hemostatic clips or electrocautery is recommended.

- Harvest a fat graft:

- Make 3 cm skin incision over previously prepared flank area
- Expose subcutaneous fat
- Remove a large piece of fat and place it into the osteotomy site
- Close this area with subcutaneous and skin sutures

- Routine subcutaneous and skin closure.

POSTOPERATIVE CARE:

- Postoperative radiographs to evaluate gap position and size, and elbow congruency.

- Splint or soft wrap depending on the activity level of the patient.
- Pain management using injectable, oral or transdermal analgesic.
- Strict confinement for 2 weeks.
- Bandage removal and suture removal in 2 weeks.
- Monthly radiographic re-evaluation until patient is skeletally mature

AXIOM: Should the gap close before patient reaches skeletal maturity, a second osteotomy may be required.

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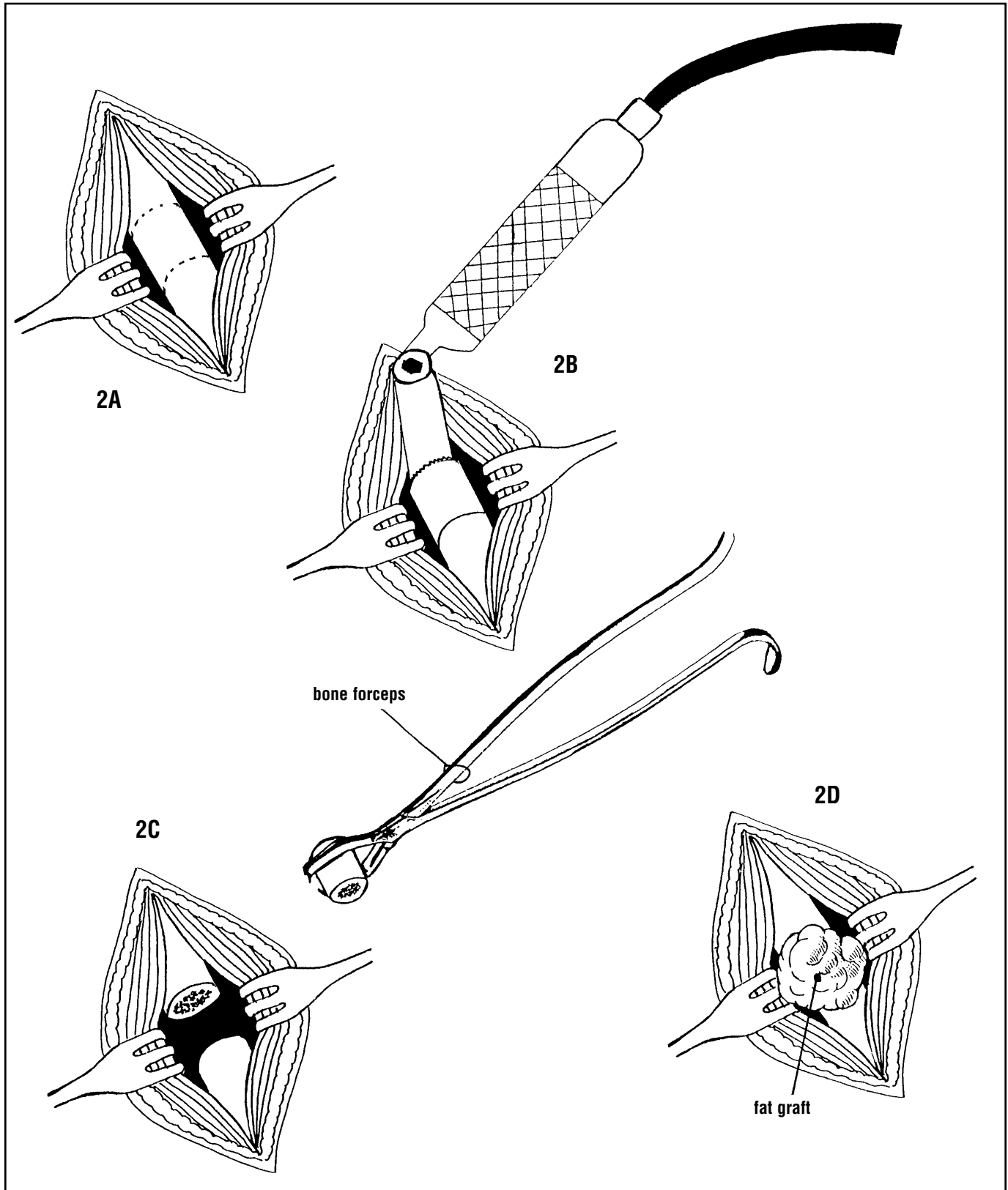


Figure 2: This schematic drawing depicts the lateral aspect of the left forepaw just above the physis of the distal ulna: **2A)** The 2 cm osteotomy site is outlined. **2B)** The oscillating nitrogen-driven bone saw performs the 2 cm osteotomy. **2C)** Bone forceps remove the 2 cm segment of bony ulna. **2D)** A fat graft is packed into the osteotomy site.

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FUTURE APPLICATIONS:

Ulnar ostectomies are also currently being performed as a possible means to treat dysplastic conditions of the elbow associated with incongruency, such as ununited anconeal process and fragmented medial coronoid process.

AUTHOR'S NOTE

If you have any questions concerning this paper, additional references, surgical supplies or sources of products mentioned or used in this protocol, please FAX us at 1-310-479-8976. We will answer your questions promptly.

Coming Attractions

Injury to the patellar ligament commonly occurs due to a sharp penetrating trauma. The overlying skin injury may be only a small puncture, obscuring the severity of the underlying ligamentous damage. On occasion, rupture of the patellar ligament may occur due to blunt injury to the limb, such as an automobile trauma.

Next month, we shall present our surgical protocol for repairing this crippling injury.

See you then!

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