




1

Options to close wounds:


TIMING

- Primary closure
- Delayed primary closure
- Secondary closure
- Second intention healing




TECHNIQUE

- Direct apposition
- Tension relieving techniques
- **Skin flaps**



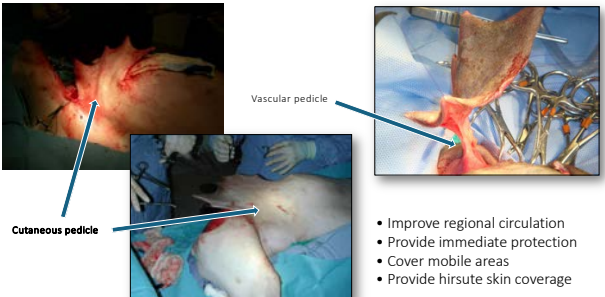
3

Considerations for reconstruction

<p>Wound factors</p> <ul style="list-style-type: none"> • Size <ul style="list-style-type: none"> • < 5cm, 5-10cm, >10cm • Location <ul style="list-style-type: none"> • Trunk, proximal limb, distal limb • Chronicity <ul style="list-style-type: none"> • Acute • Inflammatory phase • Proliferative phase • Bacterial load <ul style="list-style-type: none"> • Clean • Clean-contaminated • Structural damage <ul style="list-style-type: none"> • Tissue damage = inflammation & perfusion • Devitalized tissue • Periwound status <ul style="list-style-type: none"> • Must be healthy 	<p>Patient factors</p> <ul style="list-style-type: none"> • Species • Breed <ul style="list-style-type: none"> • Tight skin v. loose skin • Thin skin v. thick skin • Body condition • Age • Temperament • Comorbidities <p>Owner factors</p> <ul style="list-style-type: none"> • Commitment • Financial • Cosmesis <p>Surgeon factors</p> <ul style="list-style-type: none"> • Novice • Intermediate • Experienced 	
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4

Skin Flap: a portion of skin with an intact vascular attachment to its donor site.



Cutaneous pedicle


Vascular pedicle

- Improve regional circulation
- Provide immediate protection
- Cover mobile areas
- Provide hirsute skin coverage

5

Skin flaps ideal for dogs and cats:

- Inherent elasticity
- Loose skin attachment
- Direct cutaneous vessels
- Hirsute skin



6

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7

Classification of Skin Flaps:

- Blood supply
 - Subdermal
 - Direct cutaneous artery/vein
- Distance from donor site
 - Local
 - Distant
- Attachment to donor site
 - Single pedicle
 - bipedicle
- Composition



Undermining is essential for all flap development:

- Use sharp and blunt dissection
- Undermine deep to panniculus muscle
- Preserve direct cutaneous vessels

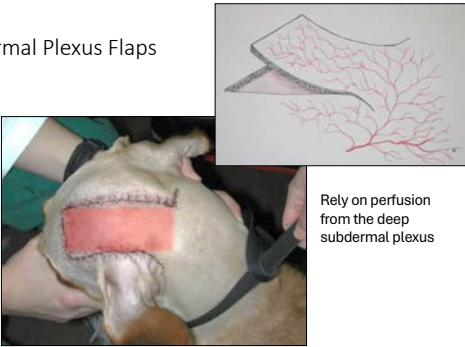
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Subdermal plexus flaps:

LOCAL	Rotating	rotation transposition interpolation
	Non-rotating	single pedicle advancement H-plasty bipedicle advancement
	Skin fold advancement flaps	
DISTANT	Direct	pouch (bipedicle) hinge (single pedicle)
	Indirect	tubes

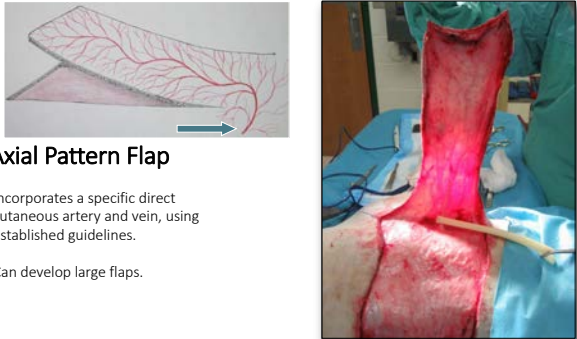
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Subdermal Plexus Flaps



Rely on perfusion from the deep subdermal plexus

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Axial Pattern Flap

Incorporates a specific direct cutaneous artery and vein, using established guidelines.

Can develop large flaps.

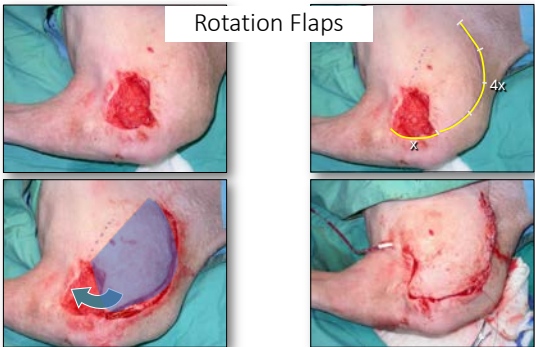
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Types of subdermal plexus flaps:

LOCAL	Rotating	rotation transposition interpolation
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12

Rotation Flaps



13

Rotation Flaps

- Consider whenever there is a triangular defect
- Can be quite a large semi-circle →
- No tension on closure
- Two-layer closure
- No back cuts into base

14

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15

Transposition flaps

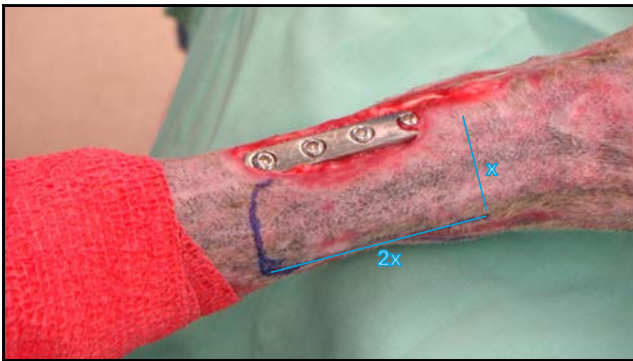
- Wound has been treated appropriately
- Needs closure rather than allowing to heal by 2nd intention

Claudia, 5 yr feral cat, wounded 2 weeks ago

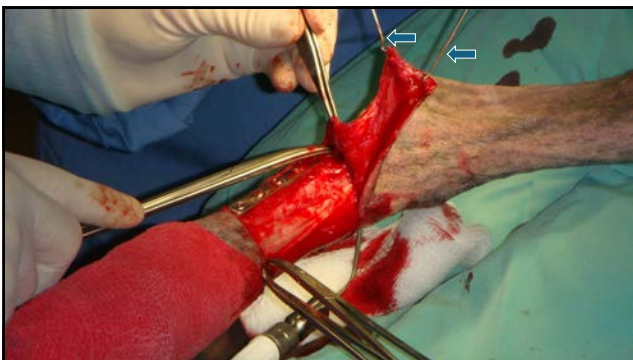
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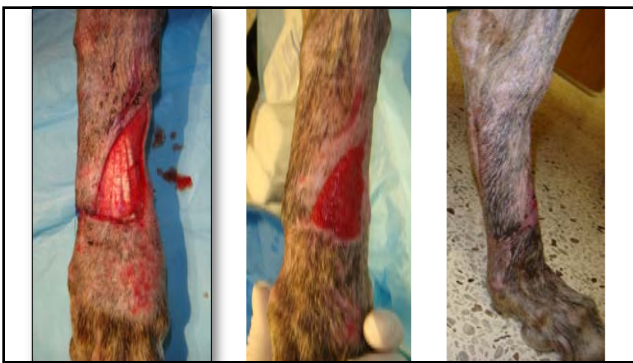
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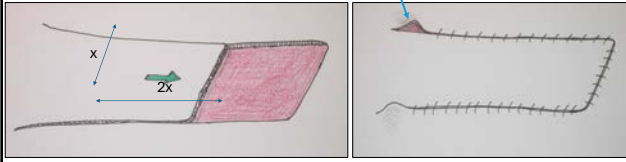
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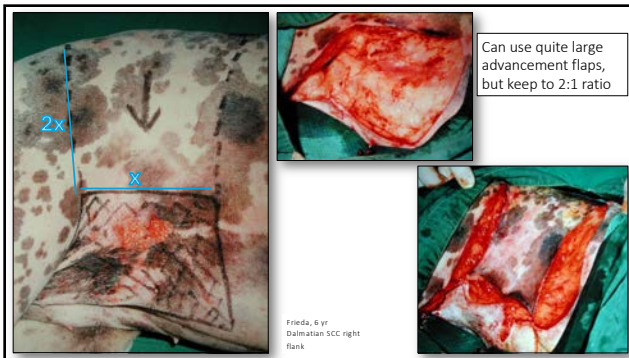
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Single pedicle advancement flap

- Rectangular or square defects
- 2:1 ratio to preserve blood supply
- Can remove 'Burow's Triangle'
- No back cuts into the flap



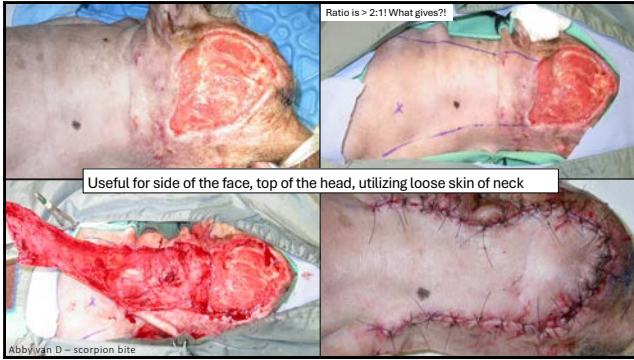
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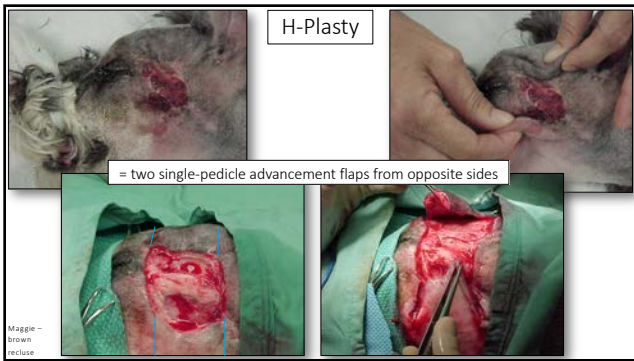
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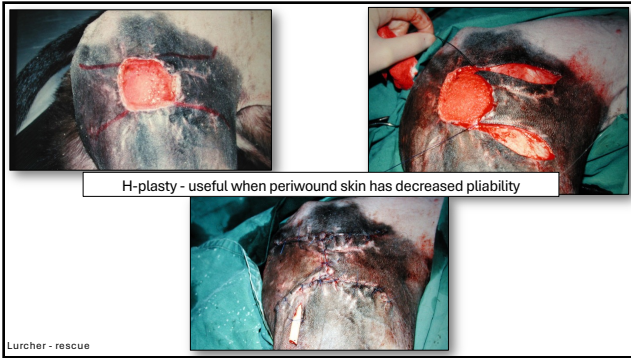
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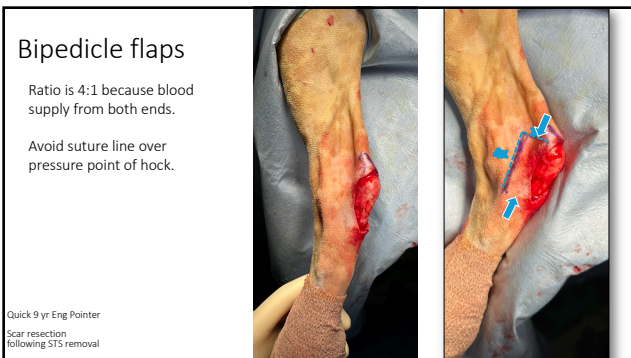


34

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35



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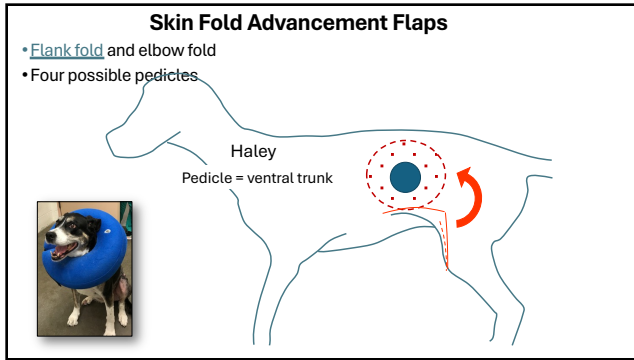


38

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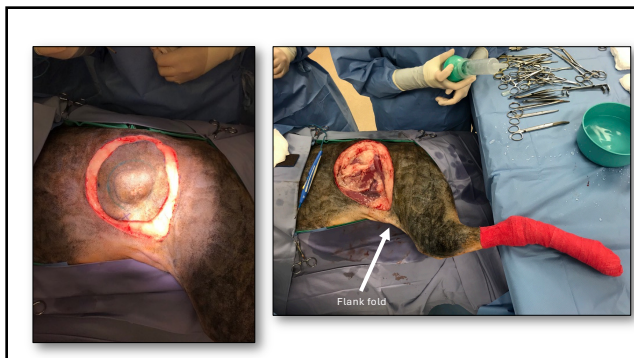
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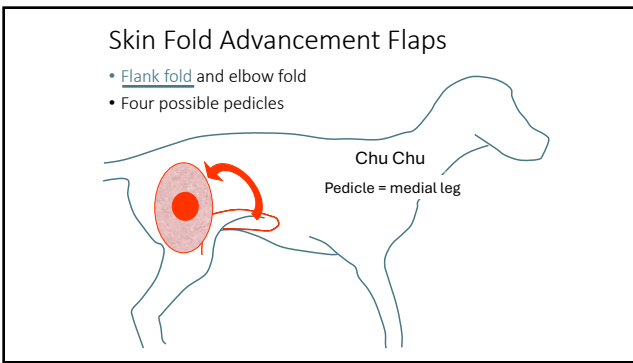
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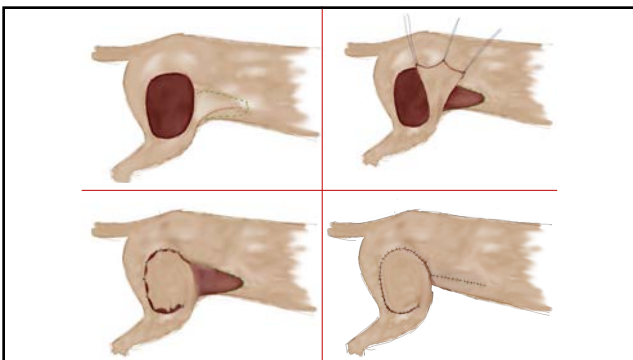
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58

Chu Chu

- 11 yr MN Mixed breed
- Nerve sheath tumor right thigh

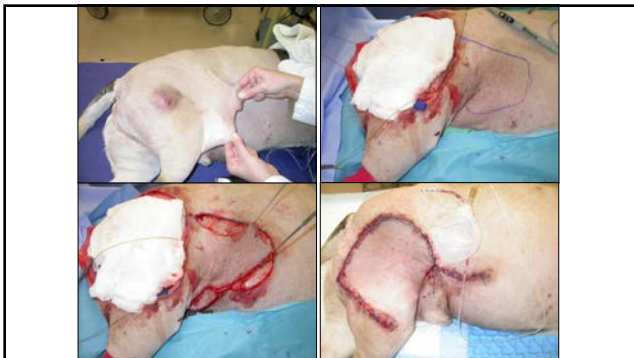


59

Wide resection with myectomy and fasciectomy



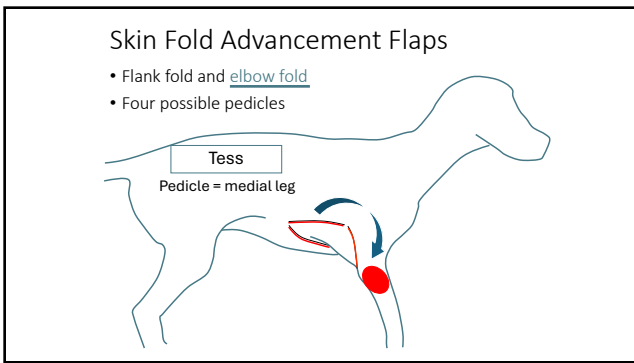
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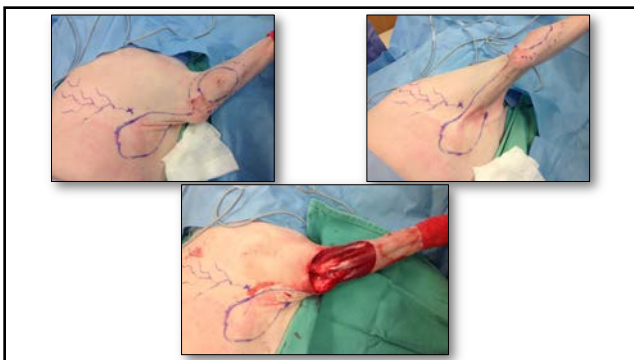
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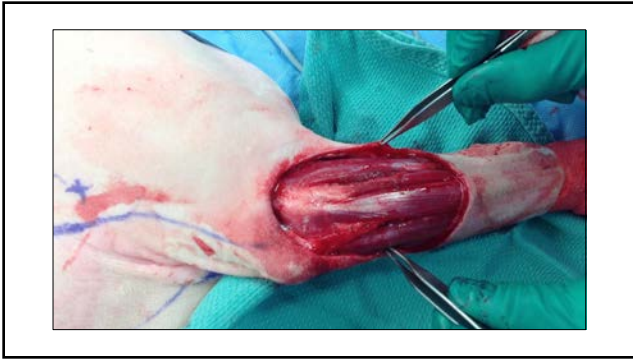
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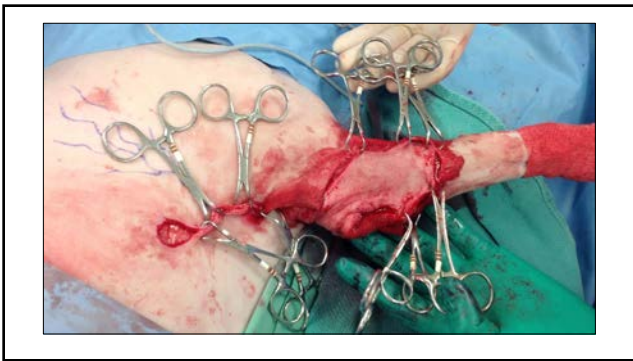
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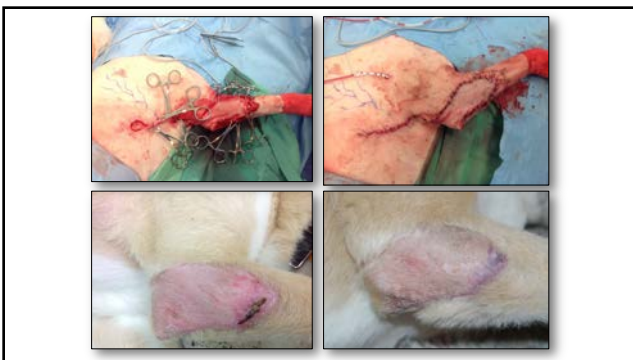
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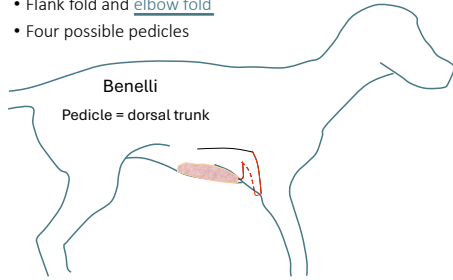
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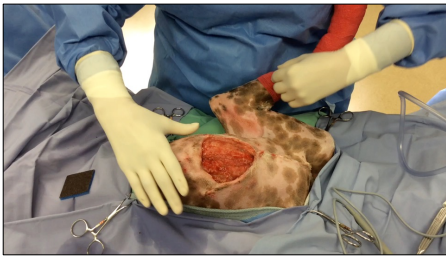
Skin Fold Advancement Flaps

- Flank fold and elbow fold
- Four possible pedicles

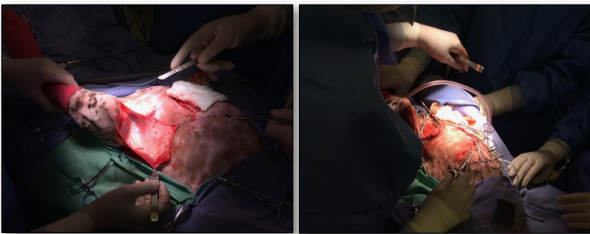


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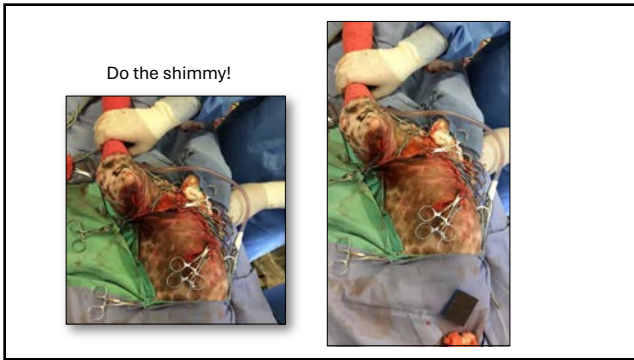
Benelli FS 3 yr GSP, traumatic wound to sternum



69



70



71



72

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91



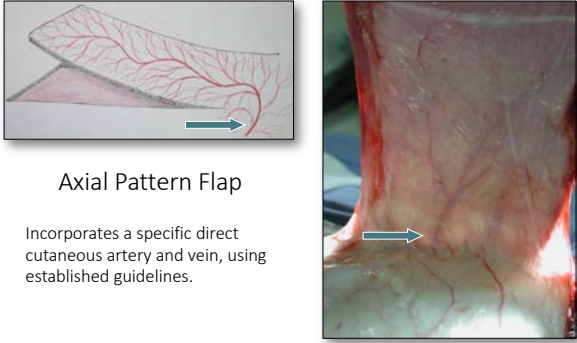
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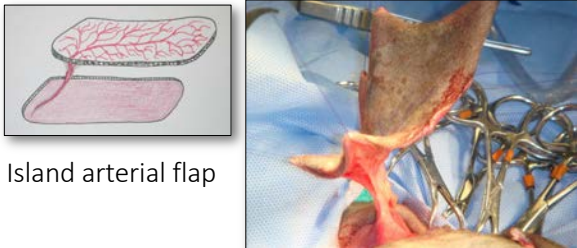


Axial Pattern Flap

Incorporates a specific direct cutaneous artery and vein, using established guidelines.

101


- Not dependent on cutaneous base, so you can island the skin
- Island flaps have increased mobility
- Can be used for microvascular free flaps



Island arterial flap

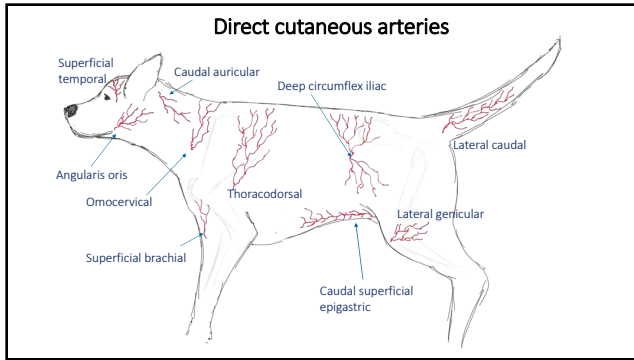
102

Axial Pattern Flaps



Large flap in a single stage
Island flaps
Deep breath

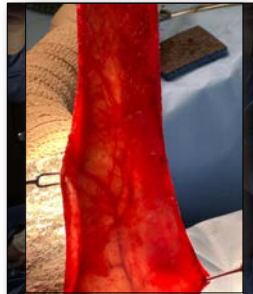
103



104

Principles of axial pattern flap development:

- Undermine deep to panniculus layer
- Preserve the direct cutaneous artery
 - Transillumination
 - Isolate and protect
- Always 'shimmy' your flap before suturing
 - To ensure optimal positioning through full range of motion
- Two-layer closure
- Consider drain placement
- Keep flap warm in post-operative period
 - Never ice!
- Expect edema with axial pattern flaps
- Bandaging - optional



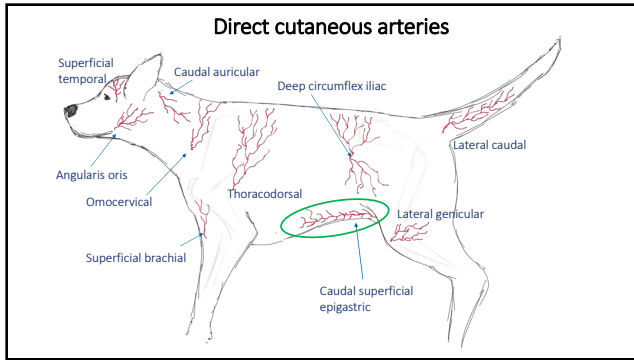
105

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106




107

Caudal superficial epigastric

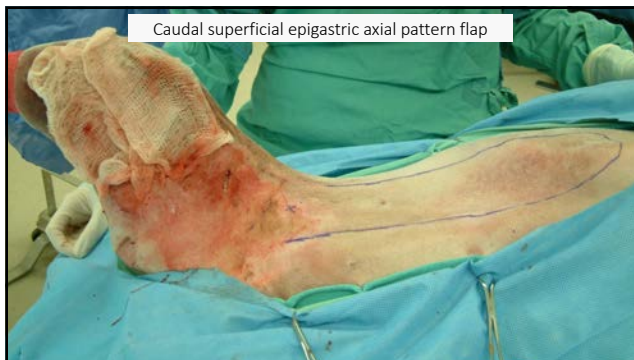
Amber, 3yo FS Golden ret. Right femoral fracture, tissue loss with joint involvement to the medial aspect of right stifle and thigh.

Femoral fracture repaired, wound management until clean-contaminated.

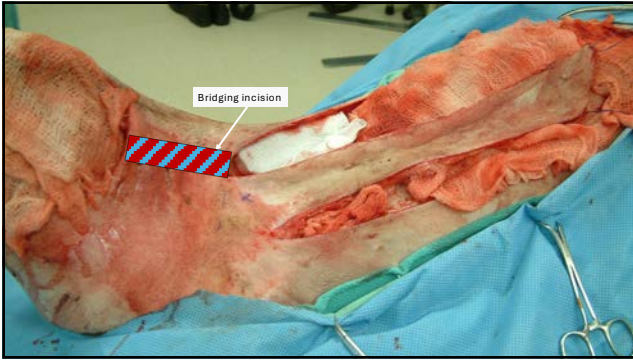
Joint stabilized with orthopedic implants with cutaneous reconstruction to follow...



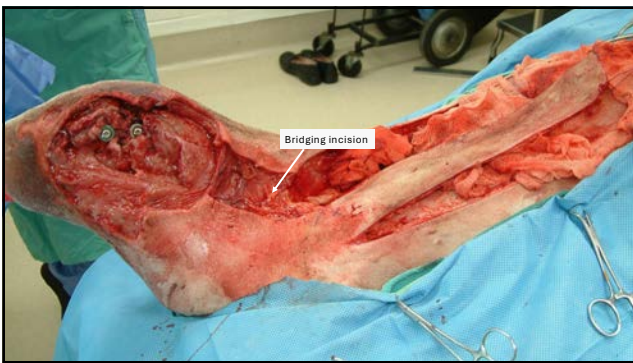
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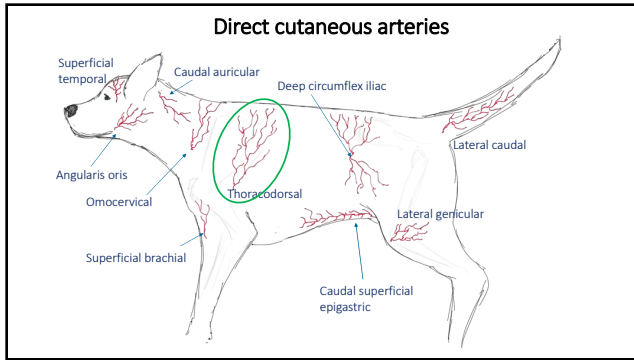
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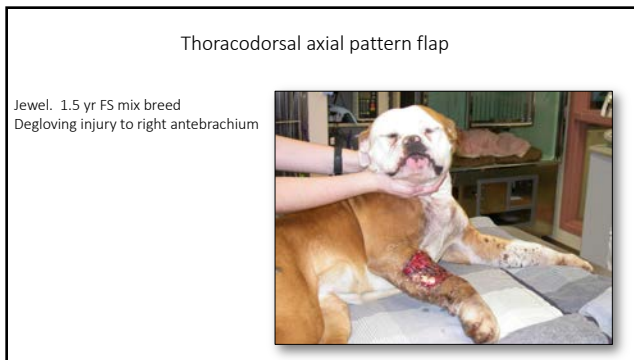
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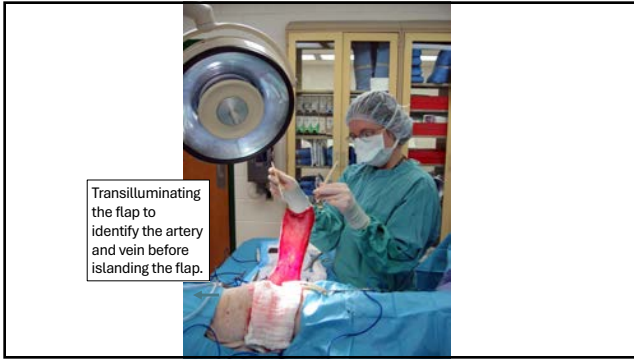
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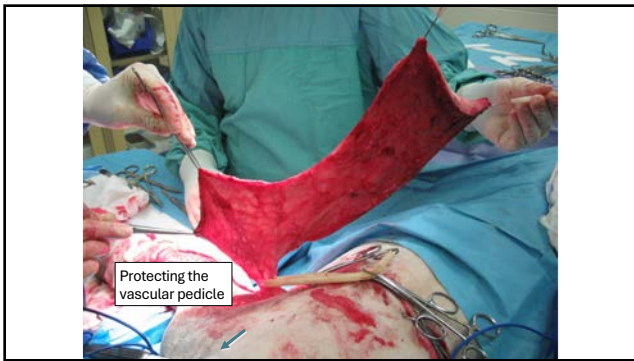
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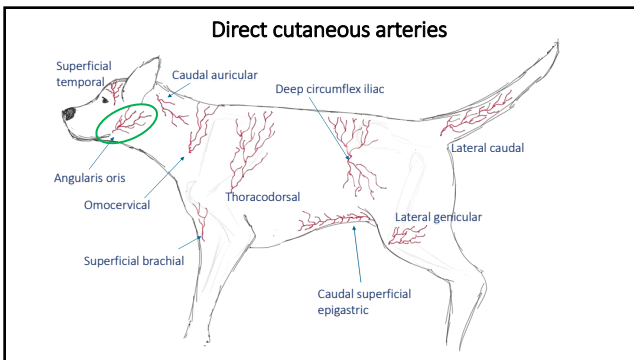
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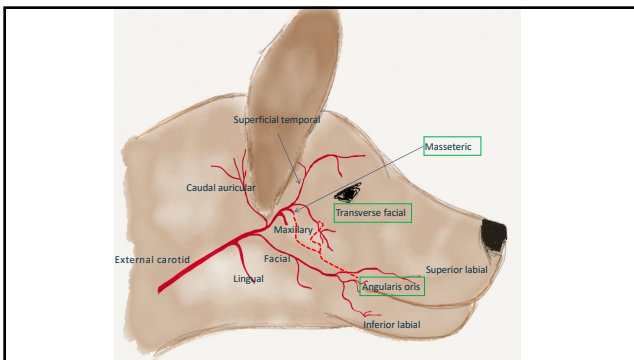
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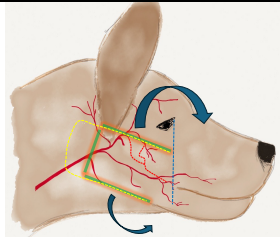
134



135

Flap borders:

- Caudodorsally oriented
- Base = commissure of lip
- Ventral margin = ventral horizontal ramus
- Dorsal margin = equidistant dorsally (ventral zygomatic arch)
- Distal extent = horizontal ear canal (wing of atlas)
- Dissection rostral to perpendicular from medial canthus

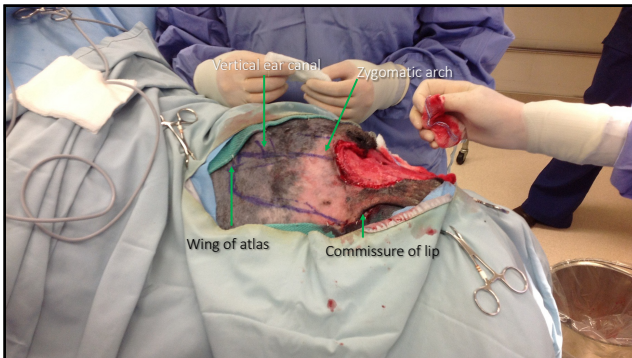


136

Buddy: 10 yr MN Shepherd mix, with chronic wound of 1 year on dorsum of nose. Etiology of wound was snakebite.



137



139

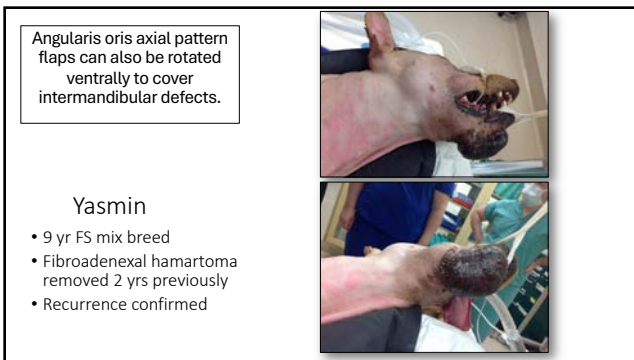


140



This flap is very robust and has drastically improved our ability to reconstruct facial trauma.

142



Angularis oris axial pattern flaps can also be rotated ventrally to cover intermandibular defects.

Yasmin

- 9 yr FS mix breed
- Fibroadenexal hamartoma removed 2 yrs previously
- Recurrence confirmed

150

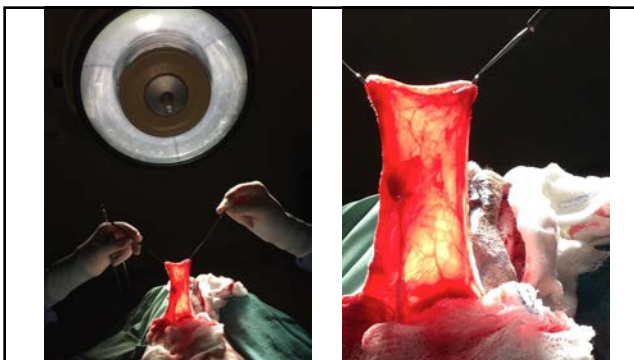
Angularis oris axial pattern flap



151



153



155



156



157

Summary

- Many, many flap options!
- Understand principles of subdermal plexus flaps and axial pattern flaps.
- Look after the wound and periwound.
- Be gentle with the flap.
- Learnt some of the common flaps.
- Read up or ask a specialist for advice.
- Transilluminate axial pattern flaps!
- Never forget to shimmy!

Mischa - lateral caudal APF

158
