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Suture technique overview

By Neelesh Patrick Jain, MD, Christian Gronbeck, MD, and Steven Brett Sloan, MD, FAAD

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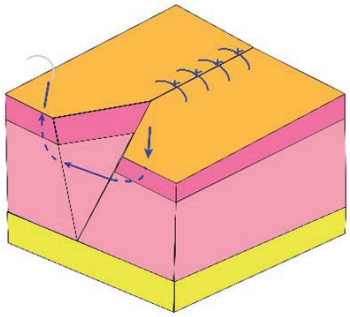
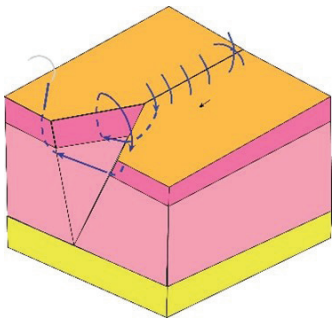
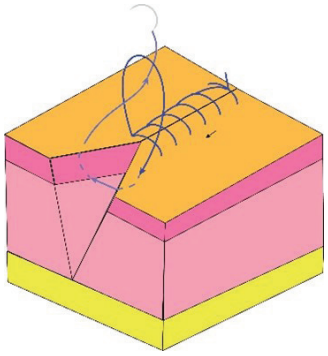
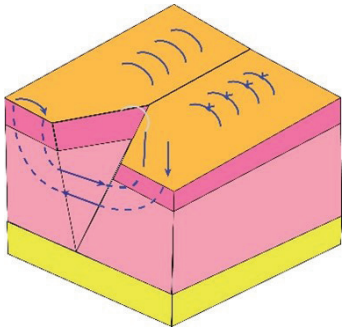
Technique	Ideal uses	Technical pearls	Visual guide
Simple Interrupted	Epidermal approximation; used for wounds of any tension. Reduces dehiscence risk but slow to place.	Needle should be inserted perpendicular to the epidermis to facilitate eversion. Initial entry point should be ½ the radius of the needle from wound edge.	
Simple Running	Epidermal approximation; ideal for low-tension wounds. Efficient to perform but higher risk of dehiscence.	In addition to above, essential to maintain uniform spacing of bites. Should also allow suffient laxity to minimize track marks during inflammatory phase of wound healing.	
Running Locked	Suitable for higher tension wounds. Provides good hemostasis and improved eversion but may strangulate epidermis.	In addition to above, it is helpful to have an assistant maintain loops under slight tension prior to passing the needle back through.	
Vertical Mattress	Eversion technique appropriate for most skin closures that also helps to eliminate dead space. Slower to place.	Needle inserted perpendicular to the epidermis. Second throw should remain superficial to the first.	

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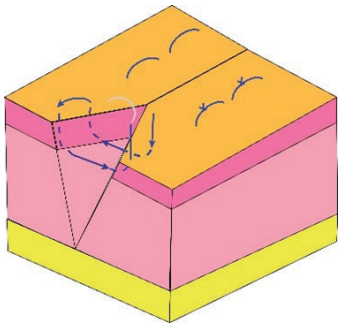
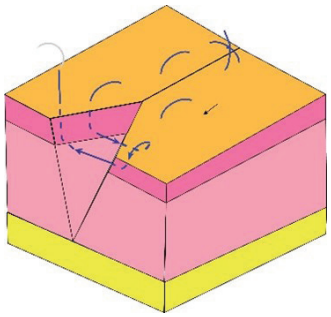
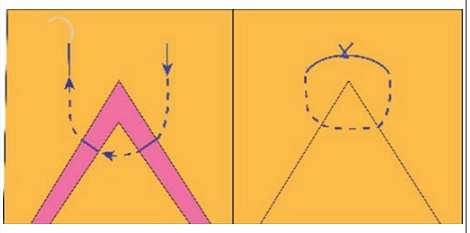
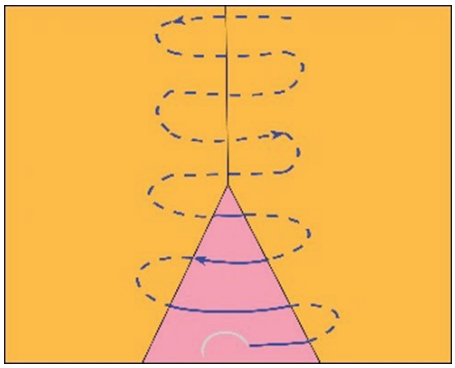
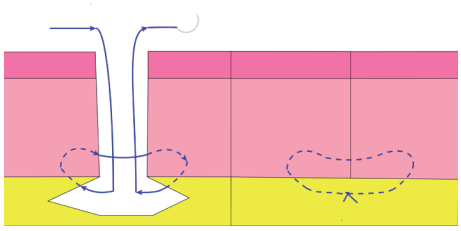
Technique	Ideal uses	Technical pearls	Visual guide
Horizontal Mattress	For wounds of any tension and for atrophic skin to avoid tear-through. Promotes hemostasis and eversion but may lead to epidermal strangulation.	Needle inserted perpendicular to the epidermis. Avoid tying suture material too tight and rely on deeper sutures to control tension to minimize necrosis risk.	
Running Horizontal Mattress	Similar to above. Provides hemostasis and eversion and minimizes tear-through risk but may strangulate epidermis.		
Half-Buried Horizontal Mattress	Ideal for flap tips and intersections. Reduces epidermal strangulation of flap tips but results in less eversion.	Not ideal under significant tension; consider placing deeper dermal sutures first to minimize tip tension.	
Running Subcuticular	For minimal to no tension, not appropriate for atrophic skin. Leaves no track marks.	Execution aided by standing parallel to the incision line and aligning needle in needle driver at 135 degrees. Taking sufficient bites and setting back each bite slightly minimize crimping.	
Buried Vertical Mattress	Highly effective in most body areas, though difficult in atrophic skin. Promotes good eversion.	Needle insertion and exit should be at 90 degrees to wound edge. Helpful to reflect wound edge sharply away from wound during insertion and release after apex in papillary dermis has been reached.	

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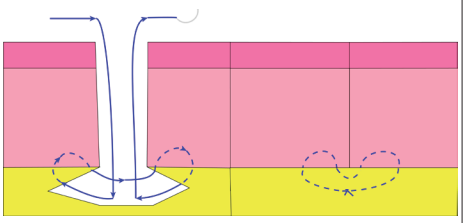
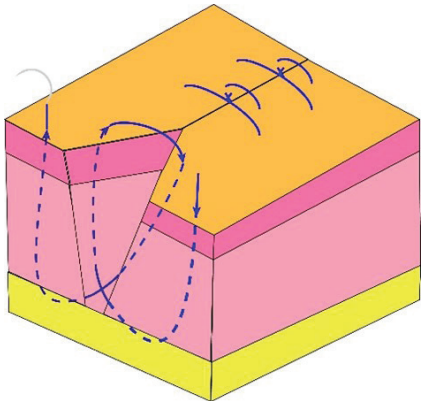
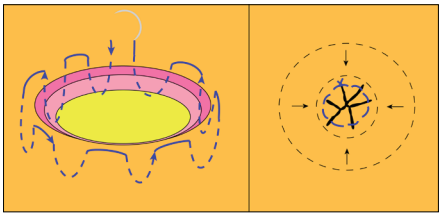
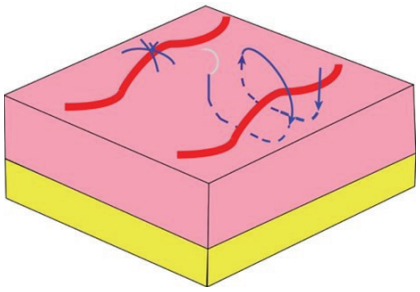
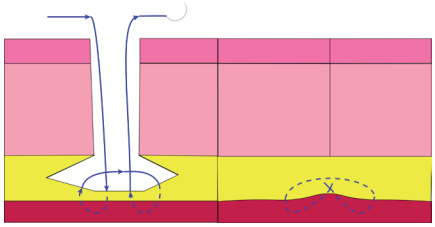
Technique	Ideal uses	Technical pearls	Visual guide
Set-back	Optimal deep dermal suture for maximal eversion and in areas of high tension but requires more undermining.	Undermining should be sufficient to allow first throw to enter the underside of the dermis 2-6 mm lateral to the deep wound edge.	
Pulley	Multiple loops are used for extremely high-tension wounds; aids in closure but increases risk of tissue strangulation.	Can be conceptualized as two subsequent adjacent sutures; with one having entry and exit points 8mm from the wound edges, the other 4mm from the wound edges.	
Purse-String	Used for circular wounds on less cosmetically sensitive areas. Decreases wound size for secondary intent healing.	There are multiple variations, and it may be perfromed in a buried fashion. Securing the suture ends in position with hemostats aids in tying the final knot under tension.	
Figure of 8	Commonly used to tie off bleeding vessels. Quick and effective for hemostasis. Also effective for punch biopsy closures prone to bleeding.	–	
Fascial plication	Used for deep, high-tension wounds; reduces tension and dead space and enables dermal and epidermal closure.	Suture should be placed at the center of the wound. Increases the length-to-width ratio of final closure, so initial ratio should be slightly less than 3:1.	

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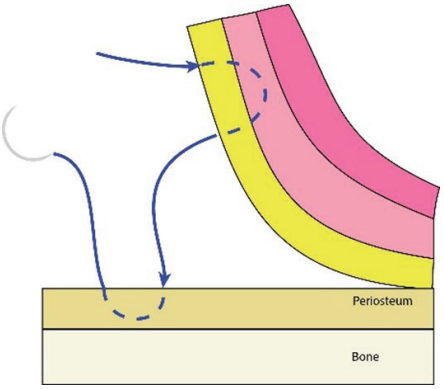
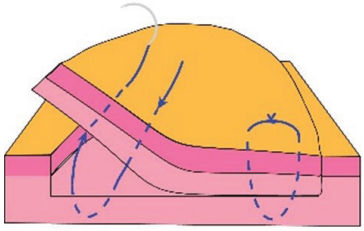
Technique	Ideal uses	Technical pearls	Visual guide
Suspension	Anchors tissue to periosteum to prevent free margin distortion and reduce tension on flap edges.	To avoid strangulation, deeper suture should be placed parallel to vascular plexus. Gentle tension on suture once placed can confirm successful tacking.	
Basting	Adheres base of graft to wound bed to improve graft survival. Can be used in addition to or instead of tie-over bolster dressings.	Similar to above, deeper sutures are placed parallel to underlying vascular plexus. On concave surfaces, suture direction should be aligned along the groove to minimize tenting risk.	

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