

Ruffled wound suturing

Closing wounds with sides of unequal lengths

Wounds that have sides of unequal length can be closed using a simple traditional dressmaker's 'ruffle pattern'. This technique has the potential to reduce the need to correct 'dog ears' (standing cones), by excising Burrow triangles.

Keywords: skin neoplasms; surgical procedures, minor; surgery, plastic

Australia has the highest rate of skin cancer in the world.¹ The majority of skin cancers are managed in the general practice setting. General practitioners are increasingly competent at excising skin cancers and repairing any resulting defects. This article describes a simple method for reducing the need to excise Burrow triangles when dealing with the closure of wounds with sides of unequal length.

Dog ears (or standing cones) commonly occur as a result of closing an ellipse with sides of unequal length. They may also occur from closing an ellipse with sides of equal length. The traditional method used to correct dog ears involves the excision of the Burrow triangle² at the end of the sutured wound. However, not all dog ears require correctional excision.³ In some cases correcting the dog ear may compromise the vascular supply, particularly if the triangle cuts into the base of the skin flap. *Table 1* shows examples of surgical options for removing dog ears.

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The author recommends the use of a ruffle pattern to reduce the need to correct dog ears by excising the Burrow triangle (or by using other methods shown in *Table 1*). This technique is used in dressmaking with the ruffled skirt pattern or pleated pattern.⁴ This method has the potential to reduce scarring, improve cosmesis and reduce operating time. It involves the surgical principle

of the 'rule of halves'⁵ or the multiple 'figure 8'⁶ where the initial suture is placed in the middle, and subsequent sutures are placed to bisect the remaining gaps (*Figure 1a-f*).

Figure 2a-c shows the application of ruffled wound suturing to a lesion on the forehead, which has been excised using an H-flap. Traditionally, advancement flaps such as H-flaps employ Burrow triangles. H-flaps are useful for small to medium sized defects that otherwise could not be closed elliptically without significant scarring. In this case, the method involves the following steps.

- Draw out an appropriate margin and excise the lesion in a square at the centre of the 'H'
- Raise the two arms of the flap in the subcutaneous plane. In the elderly, who have little subcutaneous tissue, the arms may need to include the frontalis muscle
- Lightly undermine adjacent apposing edges in the same plane
- After haemostasis, suture the two arms to the adjacent skin using the rule of halves – the initial suture is placed in the centre of the 'H'. This method enables the wound edges to be 'ruffled' to the tensioned arms and brought together to close the defect.

Table 1. Surgical options to remove dog ears

- M-plasty
- Lazy S-plasty
- Burrow triangle excision
- Rule of halves suturing – multiple figure 8 suturing
- Excision of standing cone by straight excision or hockey-stick excision
- Staged elliptical excision and crescent excision – purse string closure
- Subdermal diathermy
- Curvilinear excision

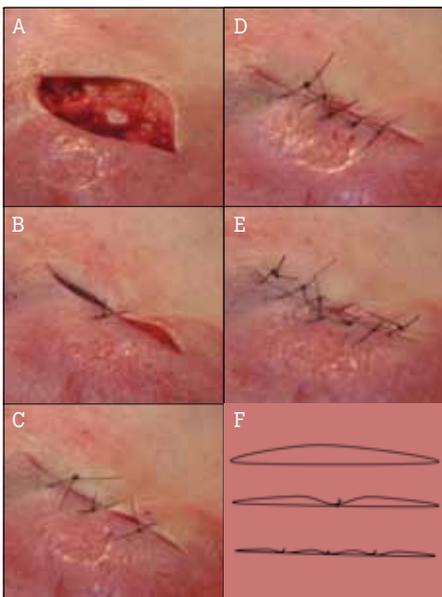


Figure 1. A–E) The rule of halves technique applied to a linear wound; F) A schematic representation of the rule of halves technique

The two arms shown in the postoperative image in *Figure 2b* are under some tension but not enough to compromise blood flow and wound edge necrosis. Over days the arms under tension will undergo tissue stretching and align contiguously with the opposite wound margin, without dog ears. The concept of tissue stretching is not new in skin surgery, an example of this principle can be seen in the placement of the tissue expander to stretch out the skin.⁷

Discussion

Use of a simple traditional dressmaker's ruffle pattern has the potential to reduce the need to correct dog ears by excising Burrow triangles. This can result in less scarring and less operative time. With experience, it is possible to perform continuous suturing while evenly ruffling up the nontensioned wound edges. Alternatively, buried sutures may be used to achieve the rule of halves. Although this method of correcting unevenness in opposing wound edges was illustrated for the H-flap (*Figure 2a–c*), the same principle can be used on other parts of the body, such as closing boomerang shaped ellipses, rotational flaps and advancement flaps.

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Figure 2. A) Drawing the figure 8; B) The postoperative wound; C) The healed wound

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References

1. Staples PM, Elwood M, Burtonet CR, et al. Non-melanoma skin cancer in Australia: the 2002 national survey and trends since 1985. *Med J Aust* 2006;184:6–10. Available at www.mja.com.au/public/issues/184_01_020106/sta10828_fm.html.
2. Robinson JK, Hanke CW, Sengelmann RD, et al. *Surgery of the skin: procedural dermatology*. 1st edn. St Louis, MO: CV Mosby, 2005.
3. Lee KS, Kim NG, Jang PY, et al. Statistical analysis of surgical dog-ear regression. *Dermatol Surg* 2008;34:1070–6.
4. Kouba DJ, Miller SJ. 'Running pleated' suture technique apposes wound edges of unequal lengths. *Dermatol Surg* 2006;32:411–4.
5. Weisberg NK, Nehal KS, Zide BM. Dog-ears: a review. *Dermatol Surg* 2000;26:363–70.
6. Tilleman TR. Direct closure of round skin defects: a four-step technique with multiple subcutaneous and cutaneous 'figure-of-8' sutures alleviating dog-ears. *Plast Reconstr Surg* 2004;114:1761–7.
7. Chun JT, Rohrich RJ. Versatility of tissue expansion in head and neck burn reconstruction. *Ann Plast Surg* 1998;41:11–6.

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