Abstract
The incidence of basal cell carcinoma, squamous cell carcinoma, and melanoma continues to increase. Surgical excision is a common preferred method for achieving cure. However, surgical closure without distorting the surrounding structures can be arduous in certain areas. Further complicating the situation is having two contiguous defects. We hope to provide an option for closing such a defect.

Objective
We present a novel technique for repairing contiguous surgical defects with a double rotation flap called an “8 to Z’ yin and yang” flap.

Materials
Standard excision tray.

Conclusion
We describe a novel method for repairing two juxtaposed defects with a double rotation flap to not only minimize wound tension but also maintain the cosmesis of the skin. There are many manners in which a lesion can be closed: by altering the defects to do a primary closure, skin grafting, designing a flap, secondary intention healing, or any combination thereof. We believe our method of closure is simple and can retain the undistorted appearance of the skin.

Introduction
Skin cancers including basal cell carcinoma, squamous cell carcinoma, and melanoma are commonly encountered in dermatologic practice. The incidence of these cancers continues to rise. Complete surgical extirpation is curative in the majority of cases. In addition to surgically curing the patient, the challenge for a dermatologic surgeon is to properly close a defect in a functional manner that not only achieves approximation of the wound but also maintains the cosmesis of an area. Additionally, in sun-damaged patients there is often more than one carcinoma present at a given site, which further complicates the closure. We intend to show the closure of two defects that are in close proximity, as well as present a novel technique for repair and closure of two contiguous surgical defects.

The “8 to Z” Yin and Yang Flap
We present our idea for a flap we call an “8 to Z” double rotation “yin and yang” flap as a surgical option to close two juxtaposed defects, and we contrast it with a similar flap that we used to close two lesions close in proximity. We will first discuss the latter, a flap that has been dealt with previously in the literature. We used this flap to address two lesions that were nearby but not contiguous.1-3

Figure 1 demonstrates two 1.5-cm lesions that were 2.5 cm apart. The flap was designed and excised, which resulted in the surgical defect seen in Figure 2. The tissue was then rotated from the two edges to create the final product seen in Figure 3. Of note, similar closures have been described in the literature as a double Burow’s “advancement” flap; however, we feel that this is best depicted as a double rotation flap when additional tissue for Burow’s triangles are not taken.

Our “8 to Z’ yin and yang” flap utilizes a similar concept of rotating tissue in two directions to close a defect. However, we build upon this concept to close two contiguous defects. Our patient is a 55-year-old man who presented with a melanoma in situ that was adjacent to a basal cell carcinoma. On the first day, the melanoma in situ on the apical scalp was excised without closure, while histopathology confirmed clearance of the lesion. On the second day, Mohs micrographic surgery was performed on the basal cell carcinoma. Eventually, the basal cell carcinoma defect converged with that of the melanoma and created a bilobed defect shaped like a figure 8.

Secondary intention was not considered, as this lesion occurred in a non-concave area and prolonged healing was not attractive to the patient. A primary elliptical closure would have necessitated the removal of additional tissue and resulted in excess skin tension. We designed an “8
to Z” double rotation “yin and yang” flap for the purpose of closing this defect in the notoriously tight area of the scalp. Wound A had a diameter measuring 4.1 cm, and wound B measured 3.3 cm, as seen in Figure 4. The right inferior border of wound A was undermined and stretched to attach to the left superior edge of the wound A. In doing this, the left superior border of wound B was approximated with the right inferior border of A. Figure 5 demonstrates the vector lines that were designed to do this. 4-0 VICRYL™ was buried to suture these edges together to create a final Z configuration. Interrupted 4-0 PROLENE™ was used to evert the closure. Figure 6 demonstrates the final lazy “Z” closure, or yin and yang configuration.

Figure 5: Demonstrates the tension vectors in order to transition the “8” to “Z”

Figure 6: Final lazy “Z” yin and yang closure that minimizes the wound tension and maintains the cosmesis of the scalp.

Discussion

There are myriad options to close a surgical wound. The simplest manner is by secondary intention, which allows the body to close the wound gradually over time. This method is frequently suitable for concave areas like the medial canthus, conchal bowl, and the junction between the nose and cheek. Secondary intention is also considered when closure of a wound would result in too great of tissue tension or if a patient cannot tolerate further surgery. A primary fusiform elliptical closure is another straightforward closure that can lead to a linear scar that is cosmetically elegant. This manner of closing is relatively low risk for complications such as necrosis. However, one drawback of this procedure is that additional tissue is typically spared to create the elliptical configuration.

Beyond fusiform closures, there are flaps and grafts. In full-thickness skin grafts, tissue is excised down to subcutis from a donor area and re-implanted in the surgical defect. However, this results in interruption of vascular supply that is not optimal for wound healing. Surgical defects that expose cartilage, bone, tendon, or have other poorly vascularized beds are not good candidates for this treatment modality. Another drawback of this technique is that the use of dissimilar tissue may result in a repair that contrasts with surrounding skin.

Flaps are often preferred to grafts, as they take advantage of the laxity of adjacent tissue to approximate the wound without a complete interruption of vascular supply. An ideal flap is one that is able to close the primary defect, yet minimize the subsequent secondary defect. The primary motion of the donor tissue surrounding a defect distinguishes a flap as either advancement, rotation, or transposition. An advancement flap is one that moves in a linear direction to close a primary defect. These flaps are best used in areas of tissue redundancy and can produce linear closures that may be hidden parallel to linear relaxed skin tension lines. A rotation flap moves nearby tissue around a pivot point to close a defect. Rotation flaps are able to redistribute and redirect tension to close tight areas such as the scalp. A transposition flap is elevated and carried over intervening skin and then sutured into place. Similar to rotation flaps, transposition flaps also redirect and redistribute tension, but instead of directly moving into a site, they have to surpass nearby tissue. One advantage of this technique is that the transposition flap may be smaller and require less tissue. Two classic examples of transposition flaps include rhomboid flaps and bilobed flaps that are frequently used in nasal reconstruction.

We present a unique double rotation flap that we call the “8 to Z” yin and yang” flap. In addition to the flap we demonstrated in Figures 1-3, other literature has described flaps that utilize an advancement flap with Burrow’s triangles in order to achieve closure of two defects.1 Our flap is similar in that we have two lesions; however, our lesions are attached rather than adjacent. While our flap builds upon the same principle as those in the literature, one advantage of the “8 to Z’ yin and yang” flap is that it doesn’t require additional incisions and tissue sacrifice to create a Burrow’s triangle. Instead, it utilizes the borders of the defects to rotate together to close the lesion. We believe this strategy minimizes the number of incisions as well as the overall defect size, which ultimately leads to a better cosmetic result for the patient.

In a society that is increasingly being diagnosed with skin cancers such as basal cell, squamous cell, and melanoma, a dermatologist’s role as surgeon is critical. The challenge of this role is not only to excise the lesion but also to close it in a cosmetic and functional manner. We present the “8 to Z’ yin and yang” flap as a potential treatment modality to close two contiguous defects.

References


Correspondence: Leela Athalye, DO; calileela@gmail.com