Usefulness of Ω-shaped Incision in Skin Tumor Excision

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Summary: We devised the Ω-shaped incision as a technique for skin tumor resection on the areas of skin with an arc-shaped fold. With this technique, the dog-ear that is formed during wound closure can be resected within the range of the first skin incision. We report this technique after performing it on the face or trunk of 18 patients and confirmed its usefulness. (Plast Reconstr Surg Glob Open 2014;2:e102; doi: 10.1097/GOX.0000000000000042; Published online 29 January 2014.)

When a skin incision is made for plastic surgery, care needs to be taken to minimize postoperative scars. Surgeons performing resection of skin tumors always take care to ensure that the postoperative suture line is consistent with wrinkle line,1,2 relaxed skin tension line,3 or contour line. We have devised the Ω-shaped skin incision as a technique for skin tumor excision on the areas of skin with an arc-shaped fold. With this technique, the dog-ear that is formed during wound closure can be resected within the range of the first skin incision. As a result, postoperative scar length can be reduced. We report this technique after performing it on the face or trunk of 18 patients and confirmed its usefulness.

SURGICAL METHODS

In the Ω-form skin incision technique, an arc-shaped skin incision line, identical to the wrinkle line or contour line, is drawn, passing through the lateral edge of the tumor to be resected (Fig. 1). The skin incision line inside the tumor is made in an inverted Ω-shaped. The tumor is first resected along the design, followed by dermis suturing at the center of the incision line, and subsequent resection of excessive skin arising on both sides, under appropriate tension using a skin hook. After trimming, dermis suturing is performed, followed by skin suturing or tape fixation to complete the operation.

RESULTS

This technique has been performed on 18 patients, including 5 males and 13 females aged between 10 months and 72 years (mean, 33.1 y). The operation sites were upper eyelid in 6 cases, eyebrow in 4 cases, scapula in 2 cases, and lip, ala of the nose, submental region, areola, genitocrural

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region, and buttock in 1 case each (Table 1). The resected tumor was nevus cell nevus in 17 cases and hemangioma in 1 case. The maximum tumor diameter was 54 mm. There were no postoperative complications and no cases required reoperation because of persistent dog-ear. On average, the postoperative suture line length per diameter was 2.64. NCN, nevus cell nevus.

### Table 1. Characteristics of Patients

| No. | Age (y) | Sex | Region       | Tissue    | Size (mm) | Length of Suturing Line (mm) | Follow-up | Complication | Length of Suturing Line/Diameter |
|-----|---------|-----|--------------|-----------|-----------|-------------------------------|-----------|--------------|---------------------------------|
| 1   | 2       | Female | Upper eyelid | NCN       | 14 × 10   | 27                            | 4 y 7 mo  | None         | 2.70                            |
| 2   | 42      | Male   | Upper eyelid | NCN       | φ8        | 32                            | 4 y 7 mo  | None         | 4.00                            |
| 3   | 69      | Female | Upper eyelid | NCN       | φ9        | 25                            | 4 y 5 mo  | None         | 2.78                            |
| 4   | 67      | Female | Submental    | NCN       | φ9        | 27                            | 4 y 5 mo  | None         | 3.00                            |
| 5   | 72      | Male   | Areola       | NCN       | φ9        | 30                            | 4 y 1 mo  | None         | 3.33                            |
| 6   | 39      | Female | Lip          | NCN       | φ5        | 14                            | 4 y 1 mo  | None         | 2.80                            |
| 7   | 26      | Female | Eyebrow     | Hemangioma | φ9        | 25                            | 4 y 1 mo  | None         | 2.78                            |
| 8   | 57      | Male   | Upper eyelid | NCN       | φ8        | 30                            | 3 y 10 mo | None         | 3.75                            |
| 9   | 38      | Male   | Eyebrow     | NCN       | φ9        | 22                            | 3 y 10 mo | None         | 2.44                            |
| 10  | 54      | Female | Eyebrow     | NCN       | φ9        | 16                            | 3 y 2 mo  | None         | 1.78                            |
| 11  | 15      | Female | Upper eyelid | NCN       | φ8        | 15                            | 3 y       | None         | 1.88                            |
| 12  | 2       | Female | Buttock     | NCN       | 54 × 34   | 96                            | 2 y 11 mo | None         | 2.82                            |
| 13  | 45      | Female | Upper eyelid | NCN       | φ7        | 17                            | 2 y 10 mo | None         | 2.43                            |
| 14  | 37      | Male   | Eyebrow     | NCN       | φ13       | 19                            | 2 y       | None         | 1.90                            |
| 15  | 2       | Female | Genitocrural | NCN       | 19 × 14   | 42                            | 1 y 10 mo | None         | 3.00                            |
| 16  | 10 mo   | Female | Scapula     | NCN       | 28 × 18   | 41                            | 1 y 4 mo  | None         | 2.28                            |
| 17  | 10      | Female | Scapula     | NCN       | 36 × 48   | 74                            | 1 y 2 mo  | None         | 2.06                            |
| 18  | 20      | Female | Ala of the nose | NCN       | φ11       | 19                            | 7 mo      | None         | 1.73                            |

On average, the postoperative suture line length per diameter was 2.64. NCN, nevus cell nevus.

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Fig. 2. Case 1: A 2-year-old girl had a nevus cell nevus 14 × 10 mm present on left upper eyelid. A, Ω-shaped skin incision is designed. B, Dermal suturing at the center of the incision line and subsequent resection of excessive skin arising on both sides. C, Condition soon after surgery, the length of suturing line was 27 mm. D, Condition 1 y after surgery, asymmetry of bilateral eyelid is not allowed.
postoperative suture line length was 2.64 times the tumor’s horizontal dimensions.

**CASE REPORTS**

*Case 1*: A 2-year-old girl had a nevus cell nevus 14 × 10 mm present on left upper eyelid. We used Ω-form incision method in tumor excision (Fig. 2A). The tumor is resected along the design, followed by dermis suturing at the center of the incision line, and subsequent resection of excessive skin arising on both sides (Fig. 2B). After trimming, dermis suturing has been added (Fig. 2C). The length of suturing line was 27 mm. The postoperative scar is inconspicuous 4 years 9 months after surgery, and asymmetry of bilateral eyelid is not allowed (Fig. 2D).

*Case 2*: A 10-year-old girl had a nevus cell nevus 48 × 36 mm present on right scapula. We used this method in tumor excision, and the length of sutur-
The postoperative scar is inconspicuous 1 year 7 months after surgery (Fig. 3D).

Case 3: A 20-year-old woman had a nevus cell nevus 12 × 11 mm present on right nasal ala. We used this method in tumor excision, and the length of suturing line was 20 mm (Fig. 4A–C). The postoperative scar is inconspicuous 11 months after surgery (Fig. 4D).

DISCUSSION

For the resection of skin tumors, resection in spindle form is usually applied along the wrinkle line, relaxed skin tension line, or contour line. Suturing after such skin incision can cause a dog-ear at both ends of the wound at the time of wound closure. To avoid dog-ear formation, it is desirable that the long axis of the spindle form is 3 times or more of the transverse dimension and that the angle...
formed by the 2 lines at both ends is less than 30 degrees. Even when the long axis of the spindle form for resection is preoperatively designed to be short, additional resection is needed if a dog-ear is formed at both ends of the suture line after plication, and this can eventually lead to extension of the postoperative scar. Available special techniques aimed at shortening the suture line include M-plasty, crown excision, and T-plasty. If one of these techniques is employed, the amount of skin resected may be reduced; however, the suture line becomes complex, which is a shortcoming.

On the body surface, there are several sites where the wrinkle line or contour line is arc-shaped (e.g., upper and lower eyelids, eyebrow, orbital edge, ala, scapula, buttock groove, and areola). If the \( \Omega \)-shaped skin incision technique is performed in tumor resection at these sites, the excess skin that arises at the time of wound closure can be resected within the range of the initial skin incision, thus reducing the length of the postoperative scar. With this technique, dermis suturing is first performed in the median region of the incision line at the time of wound closure, and this is followed by trimming off the excess skin arising on both sides. However, because the excess skin shrinks toward the inside of the arc-shaped incision line, the amount of skin to be trimmed is considerably lower. As a result, the tension applied to the wound edge after wound closure is also low, and the scar is unlikely to expand. Among the 18 cases where we have performed this technique, the length of the postoperative suture line was, on average, 2.64 times the transverse dimension of the tumor. This result confirms the usefulness of the \( \Omega \)-shaped skin incision technique in shortening the postoperative suture line.

Furthermore, this technique seems to be useful in skin tumor resection at the sites operated on in the study and at other sites where the wrinkle line or contour line is arc-shaped.

**PATIENT CONSENT**

Patients or their parents or guardians provided written consent for the use of the patients’ image.

**CONCLUSIONS**

We devised the \( \Omega \)-shaped incision as a technique for skin tumor resection on the areas of skin with an arc-shaped fold. With this technique, the dog-ear that is formed during wound closure can be resected within the range of the first skin incision. We report this technique after performing it on the face or trunk of 18 patients and confirmed its usefulness.

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**REFERENCES**

1. Kraisel CJ. The selection of appropriate lines for elective surgical incisions. *Plast Reconstr Surg*. 1951;8:1–27.
2. Courtiss EH, Longacre JJ, D'estefano GA, et al. The placement of elective skin incisions. *Plast Reconstr Surg*. 1963;31:31–44.
3. Borges AF, Alexander JE. Relaxed skin tension lines, Z-plasties on scars, and fusiform excision of lesions. *Br J Plast Surg*. 1962;15:242–254.
4. Webster RC, Davidson TM, Smith RC, et al. M-plasty techniques. *J Dermatol Surg*. 1976;2:393–396.
5. Robbins TH. The “crown” excision of facial skin lesions. *Plast Reconstr Surg*. 1976;57:251–252.
6. Hirshowitz B, Mahler D. T-plasty technique for excisions in the face. *Plast Reconstr Surg*. 1966;37:453–458.