Long-Term Outcomes of Surgical Management in the Patients with Facial Congenital Melanocytic Nevi

Bowornsilp Chowchuen MD, MBA*

* Division of Plastic Surgery, Department of Surgery, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand

Background: The challenges of management of facial congenital melanocytic nevi (CMN) are the balance of the risk of malignant transformation, surgical management and the long-term evaluation of the functional and cosmetic outcomes.

Objective: To present information on the long-term surgical management outcomes of patients with facial CMN, which may be applicable for future clinical and surgical approaches for these lesions.

Material and Method: A follow-up study was performed of patients with facial CMN that were clinically evaluated by the author at Srinagarind Hospital, Khon Kaen University, between 1993 and 2011. The clinical records, photographs, surgical managements and outcomes were analyzed.

Results: Among the 20 patients assessed, the female-to-male ratio was 2.33 to 1 with one patient being a twin. Most (95%) had a single and ten a large CMN. The surgical treatments of these lesions included: serial excision, excision with full thickness skin grafts, excision with composite graft, excision with local and regional flaps, and excision with tissue expanders and flap. The long-term outcome revealed that no patient’s condition changed or developed into melanoma. Most of the patients had an acceptable cosmetic and functional outcome. One patient had a hypertrophic scar on the face, one a mild ectropion of the lower eyelid and 2 hyperpigmentation of the skin-grafted area.

Conclusion: The author presents a number of surgical techniques that may be used for decision-making in surgical management of each CMN. For the most part, analysis of the characteristics of the CMN, comprehensive evaluation of the anatomic composition of the defects and application of good reconstructive methods will provide acceptable long-term surgical outcomes and reduce the psychological impact to parents and patients. Early surgical removal of large CMNs is recommended and long-term follow-up until adulthood are the two essentials.

Keywords: Facial congenital melanocytic nevi (CMNs), Malignant potential, Surgical management and reconstruction, Long-term outcome

J Med Assoc Thai 2011; 94 (Suppl. 6): S70-S78

Full text. e-Journal: http://www.jmat.mat.or.th/journal

Correspondence to:
Chowchuen B, Division of Plastic Surgery, Department of Surgery, Faculty of Medicine, Khon Kaen University, Khon Kaen 40002, Thailand.
Phone: 043-363-123
E-mail: bowcho@kku.ac.th, bchowchuen@gmail.com
al[11] found 12% of giant CMN developed into melanoma within their lesions. Although it is extremely rare to find a melanoma present at birth, or in infancy; most cases were found to occur within the first decade of life[12,13].

The challenges for management of CMN, especially of the facial area, are the balanced goals of CMN removal (or decreasing the risk of the developing melanoma) and the restoration of function and near-normal appearance after surgical removal.

The objectives of the present study were to (a) present the treatment methods (b) surgical managements and (c) long-term outcomes of the patients with facial CMN at Srinagarind Hospital, Khon Kaen University, between 1993 and 2011. The analysis results of these data could be useful for making recommendations for appropriate guidelines in diagnosis and treatment of these patients. The study is among the first reports on long-term surgical outcomes of facial CMN in Thailand; the information documents the current state of knowledge and is therefore applicable for setting clinical and surgical approaches to facial CMN.

Material and Method

Setting

Srinagarind Hospital is a university hospital and a major tertiary referral center in Khon Kaen, a province in the heart of the Northeast Thailand, a geopolitical region with a population of ~22 million.

Study Design

The medical records of the patients with facial CMN were reviewed, managed by, and/or with consultation by the author. The diagnosis of CMN was accomplished through clinical and/or pathologic reports. The details of different and serial reconstructive surgeries as well as the final cosmetic, functional outcome and the patient’s and his/her family’s satisfaction were analyzed.

The protocol of the present study was reviewed and approved by the Ethics Committee of Khon Kaen University, based on the Helsinki Declaration, and written informed consent for adults (or assent for minors) was obtained from each patient.

Results

Between 1993 and 2011, 20 patients with facial CMN were analyzed. The female-to male ratio was 2.33 to 1 (14 girls and 6 boys) with one patient who was a twin. The majority of patients had a single CMN (19 patients, 95%) and one patient (5%) had two CMNs. Ten patients had CMNs classified as ‘large’ and 10 had medium-sized CMNs. Table 1 presents the demographic details and Fig. 1 presents the geographic distribution of these 20 patients with facial CMN treated at Srinagarind Hospital, Khon Kaen University, between 1993 and 2011. The highest incidence recorded was in Khon Kaen and Kalasin Provinces.

The surgical treatments of these lesions are serial excision, excision with full thickness skin grafts, excision with composite graft, excision with local flaps, and excision with tissue expanders and flaps. Patient No. 12 did not receive treatment and was lost to follow-up. The long-term outcome of the other 19 patients—according to an analysis of their medical records—was performed and revealed that none of them developed melanoma and all of them were satisfied with the treatment. Most of the patients had good cosmetic and functional outcomes; albeit one patient had a hypertrophic scar on the face (patient No. 13), one had mild ectropion of the lower eyelid (patient No. 9) and two had hyperpigmentation of the skin-grafted area (patients No. 5 and 15).

Selected Patient Reports

Patient No. 4

A male, twin, born in 1990 in Khon Kaen province, presented with a large hairy nevus on the forehead, left temporal area and left eyebrow. Staged excision with tissue expansion was performed in 1996 and a composite hair baring skin graft to the left eyebrow was performed in 2001. On follow-up in 2011, at the age of 21 years, his family and he were satisfied with his facial appearance.

Fig. 1 Geographic distribution of patients with facial CMN treated at Srinagarind Hospital between 1993 and 2011
<table>
<thead>
<tr>
<th>Patient No.</th>
<th>Year of birth</th>
<th>Province</th>
<th>Diagnosis and involved area</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1968</td>
<td>Kalasin</td>
<td>Large CMN; right cheek, temporal area</td>
<td>Excision with tissue expansion</td>
</tr>
<tr>
<td>2</td>
<td>1990</td>
<td>Khon Kaen</td>
<td>Medium CMN; upper lip</td>
<td>Excision with full thickness skin graft and local flap</td>
</tr>
<tr>
<td>3</td>
<td>1992</td>
<td>Khon Kaen</td>
<td>Medium CMN; right oral commisure</td>
<td>Serial excision</td>
</tr>
<tr>
<td>4</td>
<td>1990</td>
<td>Khon Kaen</td>
<td>Large CMN; forehead, left temporal area and left eye brow</td>
<td>Staged excision with tissue expansion and composite hair baring skin graft to left eyebrow</td>
</tr>
<tr>
<td>5</td>
<td>1992</td>
<td>Chaiyaphum</td>
<td>Large CMN; left cheek</td>
<td>Excision with full thickness skin graft</td>
</tr>
<tr>
<td>6</td>
<td>1987</td>
<td>Nong Khai</td>
<td>Medium CMN; left nasolabial fold</td>
<td>Serial excision</td>
</tr>
<tr>
<td>7</td>
<td>1995</td>
<td>Khon Kaen</td>
<td>Medium CMN; right upper eyelid</td>
<td>Excision with full thickness skin graft</td>
</tr>
<tr>
<td>8</td>
<td>1993</td>
<td>Roi Et</td>
<td>Large CMN; left cheek, temporal area, left medial canthal area and nasal dorsum</td>
<td>Staged excision with cervicofacial flap and full thickness skin graft from post auricular area to temporal area and nasal dorsum</td>
</tr>
<tr>
<td>9</td>
<td>1993</td>
<td>Chaiyaphum</td>
<td>Large CMN; left cheek and nasal dorsum</td>
<td>Excision with cervicofacial flap and full thickness skin graft</td>
</tr>
<tr>
<td>10</td>
<td>1964</td>
<td>Nong Khai</td>
<td>Medium CMN; lateral canthus involve upper and lower eyelid</td>
<td>Excision with lid switch flap and rotation cheek flap</td>
</tr>
<tr>
<td>11</td>
<td>1987</td>
<td>Loei</td>
<td>Medium CMN; upper lip</td>
<td>Excision with full thickness skin graft</td>
</tr>
<tr>
<td>12</td>
<td>1997</td>
<td>Udon Thani</td>
<td>Large CMN; right cheek</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>1996</td>
<td>Kalasin</td>
<td>Giant CMN; right cheek, nose, bilateral canthal area, medial part of right upper eyelid</td>
<td>Excision and staged reconstruction with cervicofacial flap and full thickness skin graft; scar revision and lateral canthopexy</td>
</tr>
<tr>
<td>14</td>
<td>1999</td>
<td>Khon Kaen</td>
<td>Large CMN; left cheek, involving lateral pert of nose</td>
<td>Excision with cervicofacial flap and full thickness skin graft</td>
</tr>
<tr>
<td>15</td>
<td>1997</td>
<td>Kalasin</td>
<td>Medium CMN; Tip of the nose,alar area, philtrum and upper lip</td>
<td>Excision with full thickness skin graft and subsequent dermabrasion</td>
</tr>
<tr>
<td>16</td>
<td>1992</td>
<td>Roi Et</td>
<td>Compound nevus; left median canthus</td>
<td>Excision with full thickness skin graft</td>
</tr>
<tr>
<td>17</td>
<td>2000</td>
<td>Nakhon</td>
<td>Large CMN; left cheek, nasal dorsum and left leg</td>
<td>Excision and split thickness skin graft to left leg</td>
</tr>
<tr>
<td>18</td>
<td>1998</td>
<td>Ratchasima</td>
<td>Large CMN; left forehead and face</td>
<td>Excision and tissue expansion</td>
</tr>
<tr>
<td>19</td>
<td>1996</td>
<td>Sakon Nakhon</td>
<td>Medium CMN; upper lip</td>
<td>Excision with full thickness skin graft</td>
</tr>
<tr>
<td>20</td>
<td>2002</td>
<td>Kalasin</td>
<td>Medium CMN, Left medial canthal area</td>
<td>Excision with local flap</td>
</tr>
</tbody>
</table>

**Patient No. 5**
A female patient, born in 1992 in Chaiyaphum province, presented with a large hairy nevus on the left cheek. Excision with full thickness from the buttock area was performed in 1995. On follow-up in 2011, at the age of 19 years, she had mild pigmentation of the skin-grafted area.

**Patient No. 8**
A female patient, born in 1993 in Roi Et
province, presented with a large hairy nevus at the left cheek, temporal area, left medial canthal area and nasal dorsum. Staged excision with cervicofacial flap and full thickness skin graft—from the post auricular area to the temporal area and the nasal dorsum—was performed in 1995. On follow-up in 2011 (at the age of 18 years), her family and she were satisfied with her facial appearance.

**Patient No. 13**
A male patient, born in 1999 in Khon Kaen province, presented with a large hairy nevus involving the left cheek, nose, bilateral canthal area, and medial part of the right upper eyelid. Excision and staged reconstruction with a cervicofacial flap and a full thickness skin graft from the post auricular area was performed in 1998. A subsequent scar revision and lateral canthopexy was performed to correct ectropion on the right lower eyelid. On follow-up in 2011 (at 12 years of age), there was a good skin color match; however, there was also a hypertrophic scar at the scar edge on the right cheek. Minor scar revision was planned.

**Patient No. 14**
A male patient, born in 1999 in Khon Kaen province, presented with a large hairy nevus at the left cheek, involving lateral part of nose. Excision with a cervicofacial flap and a full thickness skin graft from the post auricular area (to the temporal area) was performed in 2000. On follow-up in 2011 (at the age of 12 years), there was a good skin-color match on the left side of the face. Minor scar revision was planned.

**Patient No. 15**
A male patient, born in 1997 in Kalasin province, presented with a medium hairy nevus involving the tip of the nose, alar area, philtrum and the upper lip. Excision with a full thickness skin graft from the post-auricular area was performed in 2001. Dermabrasion was performed in 2011. On follow-up in
2011 (at age 14 years) he and his family were satisfied with the results, even though there was mild hyperpigmentation of the skin-grafted area.

**Patient No. 16**

A female patient, born in 1994 in Roi Et province, presented with pigmented lesion at the left medial canthal area. Excision with a full thickness skin graft was performed in 2001. The pathology report indicated compound nevus. Minor scar revision was performed subsequently. On follow-up in 2011 (at 17 years of age), she and her family were satisfied with the results.

**Patient No. 19**

A female patient, born in 1996 in Sakon Nakorn province, presented with a hairy nevus at the upper lip. Excision with a full thickness skin graft was performed in 2005. On follow-up in 2011, at the age of 15 years, she and her family were satisfied with the results: there was good a skin-graft color-match. A minor scar revision was planned.

**Discussion**

Congenital melanocytic nevi (CMN) may appear as plaques, raised from the surrounding skin, with increased skin marking and/or appendages, and ranging in color from tan to deep blue-black. Natural
elements of rugose texture or coarse terminal hair may be present\(^1\). The clinical findings of CMN may be round or oval; smooth, regular, and sharply demarcated and usually with a uniform pigmented pattern\(^{14}\). Changes may occur within the CMN that may concern clinicians, encouraging a decision for early surgical management; these include, a rupture of a hair follicle or a cyst, trauma, infection, changes to a dermatofibroma, seborrheic keratosis-like lesion\(^{15}\), or even a malignant transformation which may present as an increasingly dark pigmentation, accelerated growth, a change in shape, the appearance of nodularity, pain, ulceration with or without bleeding, or pruritus.

The report lifetime risk of melanoma for small and medium CMN is 0 to 4.9% and typically post-pubertal\(^{16}\). Prophylactic excision of small and medium CMN can be advised anytime before puberty, in particular if it presents irritation or it is located in an area where any changes cannot be easily observed\(^{11}\). Watt et al (2007) conducted a systematic review of 8 studies, including a total of 432 giant CMNs, found patients had an increased risk of melanoma compared to the general population\(^{17}\). The management decision for large, medium and small CMNs must be done on a patient by patient basis and balance the risk of transition to melanoma and cosmetic and functional considerations\(^{15}\). Moreover, the indications for surgical excision of large/giant CMNs, other than to prevent melanoma, may include chronic pruritus, ulceration and infection\(^{19}\).

The goal of surgical treatment is to remove as much of the CMN as possible while maintaining an acceptable level of function and achieving a satisfactory cosmetic outcome. Melanoma may arise in large/giant CMNs even in the first several years of life and surgical excision should be considered as early as possible. Excision of facial large CMN presents a distinct challenge to the plastic surgeon because of the concern of the risk of malignant degeneration and the psychologically damaging impact, to both the parents and the child, due to the unsightly lesions\(^{18}\).

Many methods have been introduced for removal and reconstruction of large CMNs. Some methods have been introduced previously; including dermabrasion, chemical peels and lasers; but these are not effective for removing the nevus cells. Several surgical techniques have been described for management of large and giant CMNs\(^{19,20}\); including (a) a single stage, complete excision (including the deep margin) with primary closure and (b) a staged or serial excision, with tissue expansion, skin grafts or skin flaps\(^{21}\). A combination of these techniques is also often recommended and employed.

Of the 20 large and medium CMNs reviewed, the author’s use of (a) tissue expanders for expanded flaps was performed on 3 patients (patients No. 1, 4 and 18) (b) a full-thickness skin graft in 11 patients, and (c) serial excision in 2 patients (patients No. 3 and 6). The management options were considered relative to pigmentation, malignant potential, and anatomical location of the respective lesions\(^{20}\).

Adequate surgical excision-including the deep margin-to fascial level is recommended. Planning for excising CMN lesions in children includes taking adequate margins, and meticulous plastic surgery technique. Serial excision for facial lesions is less applicable than lesions on the trunk or extremities because of the concerns of anatomical distortion and functional disturbance. However, the technique has been used in the medium-sized lesions at the nasolabial fold and oral commissure.

Good, long-term outcomes for full thickness skin grafts from the post-auricular area occurred in patients No. 2, 5, 7, 8, 9, 11, 13, 14, 15, 16 and 19. However, skin graft hyperpigmentation did occur in two (patients...
No. 5 and 15). The donor site of patient No. 5 was from the buttock area which may be a less preferable donor site for use as a full thickness skin graft to the face. Patient No. 15 had a habit of feeding buffalo fully exposed to the sun. The use of a full thickness skin graft donor site from above the supraclavicular area is preferable for reconstruction of a facial skin defect. For a larger defect, the use of an expanded, full thickness skin graft may be appropriate. Sun protection and proper skin management for prevention of skin hyperpigmentation should be advised for high-risk patients.

Tissue expansion for large/facial giant CMNs is a helpful technique in expanding the flap to achieve more functional and aesthetic goals and may be used as an expanded skin flaps or as an expanded full-thickness skin graft\(^{(22)}\). Composite hair baring skin graft was used in patient No. 4 for eye brow reconstruction. Additionally, the technique of a local flap (Fig. 11), staged reconstruction or a combination of various techniques (Fig. 2, 4, 5, 6 and 10) may be used. A program for prevention of hypertrophic scarring should also be used especially in the high-risk patients.

Additionally, treatment by a multidisciplinary team should be introduced. A good balance of social function vis-a-vis the treatment method and outcome will lead to full cooperation between the patient, the family and surgeons. The plastic surgeon has to educate the family about the natural history of CMN, the need for its removal and the realistic expectations of scarring and surgical outcome. When excision is recommended, he must advise on the best timing with consideration of the natural history of CMN, the physical and social development of the child and especially his/her facial growth.

The establishment of The Tawanchai Foundation for cleft lip, cleft palate and craniofacial deformities has provided timely and crucial assistance for patients (especially in the realms of accessibility to hospital, follow-up and some adjunctive management programmes), in addition to that which is provided by the current healthcare system in Thailand. Analysis of the geographic distribution of medium and large CMNs among those treated at Srinagarind Hospital and the Center of Cleft Lip-Palate and Craniofacial deformities can be helpful for planning for Center’s provision of care for patients with CMN.

**Conclusion**

The author has presented the experience of a number of surgical techniques that provided acceptable and good surgical outcomes, which may be recommended for surgical decision-making for the management of each CMN. The timing for excision and reconstruction of large, facial CMNs should begin early and within the first year of life. The surgical treatment includes adequate excision, and proper reconstructive techniques. The expanded full thickness skin graft and flap is a good choice to provide the skin with optimum quality and texture. The comprehensive evaluation, appropriate reconstructive method and ancillary and multidisciplinary treatment, and long-term follow-up are essential.

**Acknowledgement**

The present study was supported by the Tawanchai Foundation for Cleft Lip-Palate and Craniofacial Deformities and the Center of Cleft Lip-Cleft palate and Craniofacial Deformities, Khon Kaen University, in Association with the Tawanchai Project. The author wishes to thank (a) all the patients with their families and the staff of the Foundation (b) the Cleft Center and the Audio-Visual Unit of Faculty of Medicine, Khon Kaen University, for their supportive participation and (c) Mr. Bryan Roderick Hamman and Mrs. Janice Loewen-Hamman for their assistance with
the English-language presentation of the manuscript.

Potential conflicts of interest
None.

References
ผลลัพธ์ระยะยาวของการรักษาทางการผ่าตัดในผู้ป่วยที่มีฝ้าดำที่ใบหน้าแต่กำเนิด

บรรณานุกรม

ภูมิหลัง: ความท้าทายของการรักษาฝ้าดำที่ใบหน้าแต่กำเนิดคือ ความสมดุลระหว่างความเสี่ยงต่อการเปลี่ยนเป็นมะเร็ง การรักษาทางการผ่าตัด และการประเมินระยะยาวของผลลัพธ์ในด้านที่ทำให้การทำงานและความสวยงาม.

วัตถุประสงค์: เพื่อนำเสนอสารสนเทศของผลลัพธ์ของการรักษาทางการผ่าตัดในผู้ป่วยที่มีฝ้าดำที่ใบหน้าแต่กำเนิดซึ่งสามารถนำไปประยุกต์ใช้เป็นแนวทางทางการรักษาทางคลินิกและการผ่าตัดด้านรูปหน้าในอนาคต.

วิสัยและวิธีการ: เป็นการคัดค้านผู้ป่วยที่มีฝ้าดำที่ใบหน้าแต่กำเนิดที่ได้รับการประเมินทางคลินิกและรักษาโดยผู้นิพนธ์ในโรงพยาบาลศรีนครินทร์ มหาวิทยาลัยศรีนครินท์ระหว่างปี พ.ศ. 2536-2554.

วัสดุและวิธีการ: เป็นการติดตามผู้ป่วยที่มีฝ้าดำที่ใบหน้าแต่กำเนิดเพื่อปรับการประเมินทางคลินิกและรักษาโดยผู้นิพนธ์ในโรงพยาบาลศรีนครินทร์ มหาวิทยาลัยศรีนครินท์ระหว่างปี พ.ศ. 2536-2554.

ผลการศึกษา: ผู้ป่วย 20 ราย มีอัตราเพศหญิงต่อเพศชายเป็น 2.33 ต่อ 1 ผู้ป่วย 1 ราย เป็นผู้ป่วยเดิม ผู้ป่วยส่วนใหญ่ (ร้อยละ 95) มีรอยโรคผิวเดียว และ 10 ราย เป็นชนิดขนาดใหญ่ การรักษาทางการผ่าตัดของรอยโรคเหล่านี้ประกอบด้วย การผ่าตัดแบบตัดหลายครั้ง การตัดออกกับการปลูกถ่ายผิวหนังแบบทั้งส่วน การตัดออกกับการปลูกถ่ายเนื้อเยื่อผสม การตัดออกกับการใช้แผ่นเนื้อเฉพาะที่ และแผ่นเนื้อจากบริเวณข้างเคียง และการตัดออกกับการขยายเนื้อเยื่อ และการใช้แผ่นเนื้อ ผลลัพธ์ระยะยาวพบว่าผู้ป่วยทุกรายไม่มีการเปลี่ยนแปลงเป็นมะเร็งผิวหนัง. ผู้ป่วยส่วนใหญ่มีผลลัพธ์ด้านความสวยงามและหน้าที่การทำงานเป็นที่พึงพอใจ ผู้ป่วย 1 รายเกิดแผลเป็นนูนบนใบหน้า และอีก 1 รายเกิดการดึงรั้วของเปลือกตาล่าง และอีก 2 รายเกิดสีคล้ำขึ้นของบริเวณที่ปลูกถ่ายผิวหนัง.

สรุป: ผู้ป่วยที่มีฝ้าดำที่ใบหน้าแต่กำเนิดมีความเสี่ยงที่มากกว่าในการเปลี่ยนแปลงเป็นมะเร็ง และมีความท้าทายในการรักษาและภาวะติดเชื้อสีแดง ผู้นิพนธ์แนะนำวิธีการผ่าตัดตัดต่อต่างๆ ที่อาจนำไปเป็นแนวทางการตัดสินใจของการผ่าตัดผู้ป่วยที่มีฝ้าดำที่ใบหน้าและราย การประเมินคลินิกที่สำคัญที่ต้องใช้ในการประเมินทั้งเงินประมาณด้วยภาวะผิวขาดของความปกป้อง และการประเมินวิธีการผ่าตัดเสริมสร้างที่ดีจะให้ผลลัพธ์ด้านการผ่าตัดในระยะยาวที่ดีและลดผลกระทบทางด้านจิตใจทางสังคมของผู้ป่วยที่ไม่ได้รับการรักษาดังกล่าวในระยะยาวเป็นร้อยละและควรมีการติดตามจนเป็นผู้ป่วย.