Curettage of Giant Congenital Melanocytic Nevi in Neonates

A Decade Later

Linda E. De Raeve, MD; Diane I. Roseeuw, MD, PhD

Background: Currently, there is tremendous uncertainty regarding how giant congenital melanocytic nevi (GCMN) should be treated. Our approach to patients with GCMN is based on 2 main considerations: (1) obtain an acceptable cosmetic result to decrease the psychosocial inconvenience to the patient, and (2) attempt to minimize the risk of malignancy. For the past 10 years we have treated GCMN by curettage in the neonatal period. We report our experience and results.

Observations: Sixteen neonates with GCMN were treated by curettage between 1990 and 2000. Biopsy specimens were obtained and the patients received close clinical follow-up. In most patients cosmetic and functional results were good, and, to date, no melanoma has been observed in this series.

Conclusions: Curettage offers an adequate alternative to surgical excision when performed during the first 2 weeks of life. Patients and parents are pleased with the cosmetic and functional results and thereby suffer less from the psychosocial inconvenience caused by these lesions. Careful long-term follow-up of these children is essential to monitor final cosmetic outcome and reduce the potential for malignancy.

Arch Dermatol. 2002;138:943-948

Giant congenital melanocytic nevi (GCMN) are disfiguring potentially malignant lesions present at birth.1,3 Most authorities agree to remove these nevi whenever possible and as early as possible.4,5 Unfortunately, these lesions are mostly too large to be removed by classic surgery. Partial removal of GCMN by debulking the superficial pigmented nevus cells by curettage, first described by Moss,6 is an alternative to excision surgery and produces good cosmetic results. We have used this technique for the past 10 years in the treatment of neonates with GCMN in the first weeks of life. We report our experience herein.

Results

All neonates tolerated the intervention well, and no major complications occurred during hospitalization. In 2 patients infection with Staphylococcus aureus was managed with systemic antibiotics. The wounds following curettage healed quickly with minimal scarring. The immediate follow-up results of all patients were impressive (Figure 1). The treated regions mostly remained pale for the first year (Figure 2A and B). Thereafter, a slight repigmentation was observed in most cases (Figure 2C), except in 2 in which no repigmentation took place (Figure 3). This occurred in cases in which there was no hair growth. Repigmentation was most obvious in cases with more notable hypertrichosis.

In 2 patients hypertrophic scarring occurred (Table). One case was on the scalp and resulted in cicatricial alopecia (patient 2). This might be owing to the fact that on the scalp, it is more difficult to find the cleavage plane, and curettage may be too deep. In patient 12 there was some delayed wound healing, and we suspect this might have been the cause of hypertrophic scarring in this patient. In most of the patients, some hypertrichosis developed later in life, starting at age 1 year. This was especially true in 1 patient who had GCMN extending from the scalp to the face.

The histologic features of the nevi prior to curettage showed that the upper dermis was entirely occupied by heavily pigmented nevus cells whereas the lower dermis contained a less dense diffuse in-
PATIENTS AND METHODS

During a 10-year period starting in 1990, we treated 16 neonates (9 girls and 7 boys) with GCMN by curettage. The GCMN were located on the scalp in 3 patients, on the face in 1, on the trunk in 7, on the upper extremities in 3, and on the lower extremities in 3. Most of the GCMN were dark brown in color and hairy, and 9 of our patients also had satellite lesions. Before starting this procedure, information on curettage, other possible treatments, and malignancy risk was given to the parents. Curettage was performed in the first weeks of life under general anesthesia as a 1-stage procedure in all neonates. Prior to or during curettage, biopsy specimens were obtained for histopathologic evaluation.

We scraped the GCMN with a sharp curette from the center to the periphery of the nevus. The curettage procedure was completed in 30 to 120 minutes. The earlier in life the curettage was performed the easier it was to find the cleavage plane. Bleeding was controlled by simple compression with sterile gauzes.

Immediately after curettage, dressings with dextranomer wound paste or alginate wound dressings were applied. These dressings were changed once daily during the first 2 days or twice daily if needed. Thereafter, petrolatum on nonadherent dressings were applied on the treated area, and these dressings were changed daily for 10 to 14 days until entire reepithelialization was completed.

Patients were followed up monthly for the first 3 months, then every 3 months for up to 1 year, and every 6 months thereafter. Follow-up visits included a total body skin examination to assess the cosmetic outcome and to detect any evidence of malignant change within the nevus or somewhere else. Complete photographic documentation was obtained for all patients.

COMMENT

Treating a child with GCMN is a challenge. To date, no absolute guidelines to treat these nevi have been given to our knowledge, and therefore, this subject remains one of the most controversial issues in pediatric dermatology. The first problem these lesions pose is that they infiltration of nonpigmented nevus cells. The curetted material consisted of epidermis with underlying upper dermis.

Positive HMB-45 staining results from the superficially located dermal pigmented nevus cells and negative staining results from the deeper dermal nonpigmented nevus cells demonstrate that the biological behavior of these 2 populations of nevus cells seems to be different. In addition, they are different in their expression of melanocytic antigen.

Follow-up biopsy findings showed that the entire upper dermis was composed of a dense connective tissue with some degree of sclerosis, but the heavily pigmented nevus cells were no longer seen. The HMB-45 staining results were negative. The deeper dermis still contained a diffuse infiltration of nonpigmented nevus cells as observed prior to curettage but did not have pigmented nevus cells; there was no immunoreactivity for HMB-45.7,8

As it was more difficult to find the cleavage plane at the border of the lesion, we also performed a histopathologic examination comparing the center of the nevus with the border of the nevus; except for a less dense infiltration of nevus cells at the border, we did not find any significant difference between these 2 sites.

To date, no malignant melanoma was observed in any of our patients during this follow-up period, and patients and parents were pleased with the cosmetic result.

We performed magnetic resonance imaging (MRI) studies in 1 patient (patient 12) as this boy had some developmental delay, but the MRI findings were normal. In the other patients, we did not perform MRI studies as the role of MRI in the routine evaluation of the patients remains to be determined.9 We recommend clinical follow-up by the neuropediatrician and that MRI studies are performed only in those individuals with neurologic signs or symptoms.
have an increased malignancy risk, estimated to be around 5%\textsuperscript{2-4,12,13}; 50% of malignant degeneration in these nevi occurs before puberty and most often in the first years of life. Additional reasons to remove these lesions early is that they are disfiguring lesions that can be an aesthetic tragedy and contribute to severe psychological sequelae. However, the desired end point of treating GCMN still is unclear. Do we have to completely remove GCMN, or should we aim to remove most melanocytes with a more acceptable cosmetic result? Complete removal of these lesions is usually difficult and sometimes impossible without functional or cosmetic mutilation. Moreover, even after complete excision of GCMN down to the fascia, the malignancy risk is not completely eradicated as malignant melanoma can occur at extracutaneous sites.\textsuperscript{14}

Advances in the treatment of GCMN have been made by using techniques such as tissue expansion,\textsuperscript{15} cultured epithelial autografts or allografts,\textsuperscript{16} and dermabrasion.\textsuperscript{17} However, the most promising results of treating GCMN were originally reported by Moss\textsuperscript{6} in 1987. He performed curettage on GCMN during the first weeks of life to remove the superficially distributed nevus cells based on the fact that at that time, there seems to be a cleavage plane between the upper and the lower dermis. This technique offers a good alternative to classic surgery when the nevi are too large to perform complete excision, and it is a technique that is of benefit for these children.\textsuperscript{7}

From our experience we want to stress 2 limitations. First, the curettage has to be performed during the first 2 weeks of life as this is the time when it is easy to find the cleavage plane. It becomes progressively more difficult later on, and cosmetic results are not as good. In 1 newborn in our series who was born prematurely, curettage was performed at day 1. The cleavage plane was the easiest to find in this neonate, and the skin came off easily. Therefore, we advise using this technique as early as possible, preferably during the first 2 weeks of life. We do not yet know why this cleavage plane is only found in the first weeks of life. It is present in the center of the nevus but is less clearly present at the margin of the lesion, and it disappears after some weeks. This could be explained by the fact that neonatal skin is fragile and that many nevus cells are present in these lesions. It is not yet known whether neonatal skin is fragile because of an immaturity of a component of the basement membrane or because the interdigitation of the rete ridges is qualitatively reduced. As this cleavage plane is not present in healthy neonatal skin and is less clear at the border of GCMN, it is possible that the bulk of nevus cells in the superficial dermis disrupts the normal dermal components such as collagen and elastin and therefore plays a role in this cleavage plane. Our histopathologic study findings indeed showed a less dense infiltration of nevus cells at the border of GCMN compared with the center of the lesion. The confluence of melanocytes in the dermoepidermal junction may also weaken the connection of the basement membrane zone. The same biologic traits that lead to this cleavage plane might be what predisposes these lesions to ulceration as described by Giam et al.\textsuperscript{18} The second limitation of the technique is the need of a specialized pediatric anesthetist and use of the intensive care unit.

The advantages of the technique are numerous. It is simple and does not necessitate complicated tools; a relatively atraumatic procedure with minimal blood loss; and a 1-stage procedure that is well tolerated by the neonate. Healing takes place in 10 to 14 days, and cosmetic results are good. Moreover, an important reduction in the number of heavily pigmented nevus cells occurs. Whether the risk of malignancy is thus reduced is still uncertain, but it could be lessened by a reduction in the total number of these biologically different superficial nevus cells.

These patients can still develop melanoma in other cutaneous or extracutaneous sites.\textsuperscript{14,19} The GCMN can be associated with leptomeningeal melanocytosis, and in a series reported by Marghoob et al,\textsuperscript{4} a melanoma in one of these patients was reported in the retroperitoneum. Rhodes et al\textsuperscript{20} stated that melanomas arising within GCMN

Figure 2. A, Giant congenital melanocytic nevus on the back. B, Result at age 5 months. C, Result at age 17 months showing some repigmentation and hypertrichosis.
may also arise from the deep component, and there is concern that it might be more difficult to detect this after curettage. We believe that it is easier to detect eventual malignant growth in GCMN treated with curettage as this treated area is less pigmented and changes can be observed more easily. We stress the importance of regular, long-term follow-up for these patients.

After reporting our first results in 1996,2 other groups also described satisfactory cosmetic results with this technique. Based on our 10-year experience and follow-up of 16 patients, functional results after curettage of GCMN in the neonate are excellent and cosmetic outcome is favorable. The reduction in pigmentation is satisfactory; in most patients curettage results in soft pale scars occasionally with some repigmentation. This reduction in pigmentation facilitates clinical follow-up. In some patients secondary hair growth may occur. Cosmetic results therefore seem to decrease slightly with time, and this should be explained to parents.

In conclusion, this technique has its place in the treatment of GCMN as cosmetic and functional results are usually better than those obtained by other surgical techniques. However, in some areas, such as the scalp, we do not recommend this technique, and tissue expanders might be a better solution since curettage in this location may cause cicatricial alopecia. On the other hand, for some localizations, such as GCMN occurring circumferentially around a limb or other areas where GCMN are difficult to excise, curettage may be the only possible treatment. We therefore consider treatment for each patient individually after weighing the risks and benefits of other possible treatments and considering the parents’ wishes. Whether malignancy risk is reduced by curettage is still a point of discussion and needs further investigation.

Accepted for publication October 31, 2001.

Corresponding author and reprints: Linda E. De Raeye, MD, Department of Dermatology, Academisch Ziekenhuis Vrije Universiteit Brussel, Laarbeeklaan 101, B-1090 Brussels, Belgium (e-mail: linda.deraeye@az.vub.ac.be).

*GCMN indicates giant congenital melanocytic nevus; ++++, very notable; ++, notable; +, moderate; and −, none.

<table>
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<th>Patient No./Date of Birth/Sex</th>
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<th>Pigmentation Before</th>
<th>Pigmentation After</th>
<th>Hair Growth</th>
<th>Hypertrophic Scarring</th>
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REFERENCES


News and Notes

Regional Conference in Dermatological Laser and Facial Cosmetic Surgery will take place September 13-15, 2002, at the Hong Kong Convention and Exhibition Centre, Hong Kong. Main themes include facial contouring, facial rejuvenation, hair transplant, hair removal, pigment laser, and vascular laser. Workshops will be held on the following topics: chemical peel and skin care products, botulinum toxin, lasers and intense pulsed light source therapy of pigmented lesion, nonablative skin rejuvenation, and treatment of cutaneous vascular lesion. Direct inquiries to Secretariat, The Federation of Medical Societies of Hong Kong, 4/F, Duke of Windsor Social Service Building, 15 Hennessey Rd, Wan chai, Hong Kong; telephone: (852) 25278898; fax: (852) 2866 7530; e-mail: cosfmshk@netvigator.com.