

# Giant Congenital Nevus: from Diagnosis to Reconstruction: A 10-Year Experience at Rabat Children's Hospital

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## Abstract

## Original Research Article

Giant congenital nevus (GCN) is a rare, benign pigmented lesion present at birth, with an estimated incidence of 0.2 to 2.1 per 10,000 live births. Although benign, it carries a risk of malignant transformation, particularly into melanoma, and may involve the central nervous system, leading to neurocutaneous melanosis. Beyond medical risks, GCN presents significant psychosocial and surgical challenges, especially in resource-limited settings. This study reports a ten-year clinical experience in managing GCN at Rabat Children's Hospital, evaluates outcomes associated with different surgical techniques, and proposes a practical treatment algorithm suitable for low-resource environments. A retrospective descriptive analysis was conducted from April 2012 to August 2022 in the Plastic Surgery Unit, including 26 pediatric patients with congenital nevi of varying sizes and locations. Demographic data, clinical presentation, surgical interventions, hospital stay, and postoperative outcomes were analyzed, with photographic documentation and independent verification ensuring reliability. Among the patients (62% female; mean age 7.8 years), 54% had giant nevi, most frequently located on the face (62%). Surgical management included simple excision (11.5%), iterative excision (26.9%), total or partial skin grafting (50%), and tissue expansion (11.5%). No cases of melanoma or neurocutaneous melanosis were observed. Postoperative complications were minimal, with 7.7% experiencing partial graft loss and 11.5% developing retractile scarring. Treatment decisions were tailored to lesion characteristics and patients' socioeconomic context. These findings underscore the clinical and psychosocial burden of GCN and highlight the importance of a flexible, patient-centered approach in resource-constrained settings. While advanced techniques such as tissue expansion provide superior cosmetic outcomes, simpler methods like excision with grafting remain effective and accessible. Given the small sample size and retrospective design, results should be interpreted with caution, and larger prospective studies are needed to validate these recommendations.

**Keywords:** Congenital nevus, giant, surgery, skin expansion.

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## INTRODUCTION

Giant congenital nevus (GCN) is a rare, benign pigmented skin lesion present at birth, with an incidence of 0.2 to 2.1 per 10,000 live births. Despite its benign nature, GCN carries a risk of malignant transformation, particularly into melanoma, and may involve the central nervous system, leading to neurocutaneous melanosis. The visibility and extent of these lesions also pose major psychosocial challenges for patients and families.

Surgery remains the primary treatment, with approaches varying according to lesion size, location, patient age, and available resources.

This study aims to describe our clinical experience with GCN over ten years, evaluate the outcomes of different

surgical techniques, and propose a practical treatment algorithm adapted to resource-limited settings. By sharing our decade-long experience, we aim to contribute to the development of context-sensitive guidelines for the multidisciplinary management of GCN in pediatric populations.

## MATERIALS AND METHODS

We conducted a retrospective and analytical study over a ten-year period, from April 2012 to August 2022, in the Plastic Surgery Unit (Surgery C) of Rabat Children's Hospital, CHU Ibn Sina. The study involved pediatric patients managed for congenital nevi of varying sizes and locations.

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Inclusion criteria were: all patients who had congenital nevi of different sizes. And only 3 patients were excluded due to unavailability of outcome data.

Data were collected from the hospital's electronic medical records and included demographics (age, sex), lesion characteristics (size, location, presence of satellite nevi), type of surgical intervention, hospitalization duration, and postoperative outcomes. Photographic documentation, obtained with parental consent, was used to monitor lesion evolution and aesthetic outcomes.

To minimize selection and information bias, all eligible cases over the study period were included consecutively, and data extraction was performed by two independent investigators using a standardized form. Discrepancies were resolved by consensus to ensure data reliability.

## RESULTS

Among the 26 patients included, 62% (n = 16) were female and 38% (n = 10) male, with a sex ratio of

0.61. The mean age was 7.8 years (range: 1–14 years), with a slightly lower mean age in females (6.12 years) compared to males (7.7 years). Most patients (77%) had public health coverage, allowing for easier access to surgical care. The remaining 23% faced financial limitations impacting treatment quality due to the cost of grafts and hospital stays.

### Nevi were classified by size:

- **Small** (<1.5 cm): 7.69% (n = 2)
- **Medium** (1.5–20 cm): 38.46% (n = 10)
- **Giant** (>20 cm): 53.84% (n = 14)

### Anatomical locations:

- **Face**: 61.53% (n = 16)
- **Back**: 15.38% (n = 4)
- **Neck and thighs**: 7.69% each (n = 2)
- **Abdomen and scalp**: 3.84% each (n = 1)

Satellite lesions were present in 15.38% (n = 4), and multiple locations were affected in 19.23% (n = 5).

**Table 1. Demographic and Clinical Characteristics of Patients**

| Variable                      | Result                                               |
|-------------------------------|------------------------------------------------------|
| Total number of patients      | 26                                                   |
| Sex (F/M)                     | 16 (62%) / 10 (38%)                                  |
| Mean age (years)              | 7.8 (range: 1–14)                                    |
| Health coverage               | 77% (covered) / 23% (uncovered)                      |
| Nevus size                    | Small: 2 (7.7%) Medium: 10 (38.5%) Giant: 14 (53.8%) |
| Most frequent location        | Face (61.5%)                                         |
| Presence of satellite lesions | 4 (15.4%)                                            |
| Multiple locations involved   | 5 (19.2%)                                            |

**Treatment was adapted to the patient's lesion size, location, age, and socioeconomic context. Therapeutic modalities included:**

- **Observation only**: 1 patient (scalp nevus, no malignant or neurological signs)
- **Simple excision with direct closure**: 3 patients (back and thigh)
- **Iterative excision** (Figure 3): 7 patients (6 facial, 1 dorsal with satellites)
- **Total skin graft** (Figure 1): 8 patients (face, frontal, parietal areas)
- **Partial skin graft**: 5 patients (face and arms)
- **Tissue expansion** (Figure 2): 3 patients (one with 60% body surface nevus and another with fronto-parietal nevus)

Hospital stay duration varied:

- **Iterative excision**: outpatient, with follow-up every 3–10 months
- **Grafts**: 5–7 days
- **Tissue expansion**: 2–3 days for prosthesis placement + second short stay after expansion phase

**No cases of malignant transformation or neurocutaneous melanosis were observed. Postoperative outcomes were favorable:**

no infections, hematomas, or seromas. Two patients (7.69%) experienced partial graft loss, managed with directed wound healing. Retractable scars were observed in 3 patients (11.53%).

**Table 2: Surgical Treatment Modalities and Outcomes**

| Treatment Type     | Patients (n, %) | Postoperative Complications                |
|--------------------|-----------------|--------------------------------------------|
| Observation only   | 1 (3.8%)        | None                                       |
| Simple excision    | 3 (11.5%)       | None                                       |
| Iterative excision | 7 (26.9%)       | None                                       |
| Total skin graft   | 8 (30.8%)       | Partial graft loss in 2 patients (7.7%)    |
| Partial skin graft | 5 (19.2%)       | Retractable scarring in 3 patients (11.5%) |
| Tissue expansion   | 3 (11.5%)       | None                                       |

Due to the small sample size, basic statistical tests (Chi<sup>2</sup>, Fisher) were not statistically significant and are therefore not reported. A descriptive analysis was

prioritized. Larger studies may allow for correlation between treatment modalities and outcomes.



**Figure 1: Total skin graft**



**Figure 2: Thin skin graft on forehead, total skin graft on nose with Z-plasty and scalp skin expansion**



**Figure 3: Iterative suture excision**

## DISCUSSION

Our findings are consistent with previous literature in several respects. The observed female predominance (62%) mirrors trends reported by Lanier (56.7%) and Bellier-Waast (55%). Similarly, the most frequently affected anatomical areas in our study—face, back, and scalp—are well-documented in prior series as preferential sites for congenital nevi.

In terms of classification, Latouche emphasized the importance of considering both size and anatomical context when defining "giant" nevi. For instance, a 3 cm lesion on the eyelid may pose greater surgical and aesthetic challenges than a 5 cm lesion on the trunk, justifying a more flexible classification system.

Surgical management strategies described in the literature are heterogeneous. At the University Hospital of Marrakech, for example, the most commonly used techniques included combined surgery and iterative excision (20% each), followed by tissue expansion and grafting (15% each). Our experience parallels these findings, with total or partial skin grafts and iterative excisions as predominant approaches. Notably, Zaal *et al.*, stressed the utility of tissue expansion for scalp and facial nevi, citing superior cosmetic results and reduced graft complications—an outcome we also observed in our cohort.

Postoperative complication rates in our series—11.5% retractile scarring and 7.7% partial graft loss—are comparable to those reported in the literature, where minor complications range between 5% and 20% depending on technique and anatomical location. Importantly, no infections, hematomas, or seromas were reported, highlighting the procedural safety in our unit despite resource constraints.

We did not observe any cases of melanoma or neurocutaneous melanosis in our cohort. However, this likely reflects the study's limited sample size ( $n = 26$ ) and relatively short follow-up period, rather than a true absence of malignant potential. Ruiz-Maldonado and Egan reported melanoma rates of 3.75% and 4.34%, respectively, in patients with giant congenital nevi, reinforcing the critical need for long-term surveillance. These findings further support the integration of photographic documentation and regular clinical reviews into follow-up protocols.

### Proposed Management Algorithm

Based on our clinical experience, we propose a preliminary, adaptable algorithm for the surgical management of congenital nevi:

- **Small nevi** with sufficient skin laxity: single-stage excision with layered closure.
- **Medium-sized nevi**: staged iterative excisions.
- **Giant nevi**: individualized strategy based on socioeconomic status and location:

- **Higher-income patients**: tissue expansion for improved aesthetic results.
- **Lower-income patients**: excision with full-thickness or split-thickness skin grafts.
- **Facial nevi**: excision followed by full-thickness grafting when feasible.
- **Extensive nevi** (>80% body surface): current techniques often yield limited success due to prolonged duration and risk of patient dropout.

This algorithm is not prescriptive but serves as a decision-making aid, especially in contexts where resources and patient compliance vary widely.

In low-resource settings, managing GCN poses significant challenges due to limited access to specialized care and financial constraints. Although techniques like tissue expansion yield better aesthetic results, they are often impractical for uninsured patients or those living far from hospitals. As a result, simpler options like excision with grafting are more feasible. Adapting treatment strategies to the socioeconomic context is crucial to ensure effective and realistic care.

## CONCLUSION

This single-centre retrospective study highlights the complex challenges posed by giant congenital nevi, which extend beyond dermatological concerns to include significant psychosocial and surgical implications. Although rare, these lesions require a multidisciplinary approach that considers medical risks, cosmetic outcomes, and family preferences. Our ten-year experience at Rabat Children's Hospital underscores the necessity of adapting treatment strategies to both clinical presentation and socioeconomic context. However, findings should be interpreted with caution given the study's small sample size and retrospective design. Further multicentre, prospective studies are needed to validate our observations and proposed management algorithm.

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