

Surgical Therapies for Vitiligo



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KEYWORDS

• Vitiligo • Surgery • Repigmentation • Graft • Recipient site • Donor site

KEY POINTS

- Vitiligo is a disorder characterized by the development of depigmented macules and patches that can be treated with surgical intervention.
- Surgery is a safe and effective treatment option in select candidates with vitiligo.
- Preoperative evaluation, choosing an appropriate surgical technique, and postoperative management are important components in ensuring optimal results.

INTRODUCTION

Vitiligo is a disorder of dyspigmentation characterized by the development of depigmented macules and patches over the body. Treatment is essential in patients who have a significantly diminished quality of life as the psychosocial impact of this condition is greater than many other diseases. Topical, oral, light-based, and surgical therapies are often used in combination to achieve optimal results. Vitiligo surgery is an important, but underperformed, treatment of vitiligo that was first reported in 1947 by Haxthausen and colleagues.¹ Since then, surgical techniques have become more sophisticated and varied, with each method having unique advantages and disadvantages. With this article, the authors hope to provide a comprehensive overview of vitiligo surgery, including preoperative, perioperative, and postoperative considerations.

Preoperative Evaluation

Patient selection

The selection of suitable candidates for surgical intervention is key, as not all patients will benefit

from a surgical approach (**Table 1**). Usually, surgery is performed after failure of medical management for several different types of leukoderma, including vitiligo, piebaldism, halo nevi, physical and chemical leukodermas, and nevus depigmentosus. The difference among the variable responses to therapy seems to be based on the immunology of patients. Patients with stable disease or a nonimmune basis to their depigmentation usually have a better response to surgical intervention.

When evaluating patients with vitiligo for surgery, a detailed history needs to be obtained. First, the clinical subtype of vitiligo should be determined. Vitiligo is described as segmental and nonsegmental, with generalized vitiligo being the most common variant of nonsegmental vitiligo. Segmental vitiligo is unilateral, stable, and poorly responsive to medical management, whereas generalized vitiligo is bilateral and symmetric, with a waxing and waning course.² Patients with segmental or focal vitiligo have an extremely favorable response to vitiligo surgery, and it is a first-line option in this population.³ In contrast, treatment of other subtypes with surgery

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Table 1
Criteria for patient selection in vitiligo surgery

Positive prognostic indicators	Negative prognostic indicators
Leukoderma treatable with surgery	Koebnerization
Segmental/focal vitiligo > generalized vitiligo	New or growing lesions within the past 6 mo
Stable disease	Distal fingertip or perioral involvement
Lesions on face/neck > trunk > extremities	Lesions over bony prominences and distal extremities
	Keloidal tendencies
Additional screening questions	
• Previous treatments to ensure failure of medical management except in focal/segmental vitiligo where surgery is first-line option	
• Significant bleeding issues or comorbidities interfering with surgery	
• Medications, allergies, and past medical history	

is often less successful and should only be used when medical management has failed and patients have stable disease.

Disease stability is another parameter that must be evaluated before surgery and is defined by the lack of new or growing lesions within a given time frame, usually between 6 months to 2 years. Several methods can be used to assess stability, such as patient report, serial photography, and validated scoring systems. These methods of evaluation include a lack of change in the Vitiligo Area Scoring Index (VASI), Vitiligo European Task Force Assessment (VETF), and a low Vitiligo Disease Activity Score (VIDA). The VIDA is a scoring method that assesses disease stability in patients who have discontinued treatment of vitiligo for at least 6 months.⁴ In cases whereby stability or treatment outcome is uncertain, performing a test spot with a single punch graft in the center of a stable, depigmented lesion to assess the degree of repigmentation is useful.^{5,6} Koebnerization, which involves depigmentation at sites of previous trauma, is an indicator of unstable disease. Future methods for assessing disease stability include reflectance confocal microscopy,⁷ total antioxidant status,⁸ antimelanocyte antibody levels, and measurement of serum catecholamines and their metabolites.⁹ Measurement of other cellular markers, such as interleukin 17,¹⁰ chemokine (C-X-C motif) ligand (CXCL) 9 and 10,¹¹ and microRNA,¹² may also play a role in determining disease stability.

Recipient site location, which refers to the site of the lesion being treated, should be taken into account, as areas with a greater vascular supply and follicular density, such as the head and neck, have a better response to surgery than the extremities.^{13,14} Presentations associated with

poor outcomes include the acrofacial variant, which is characterized by perioral and distal fingertip involvement around the nail bed. Areas over joints also respond poorly, possibly because of repeated friction and injury at these locations.¹⁴ Patients must also be screened for keloidal tendencies, significant bleeding issues, blood-borne infections, and additional contraindications to surgery.

Consultation

Preoperative discussion is focused on educating patients about the procedure, screening for candidacy, and obtaining informed consent. General information about vitiligo as well as perioperative and postoperative expectations are discussed. To ensure that no contraindications to surgery or potential allergies to anesthesia exist, past medical history, medications, and drug allergies are reviewed. Risks of the procedure and the measures taken to minimize their occurrence are also explained. These risks include bleeding, infection, scarring, pain, contact dermatitis from dressings, and anesthesia-related arrhythmias or allergy. To ensure that patients have realistic expectations, providers must emphasize that repigmentation and color matching takes several months to years and that surgery is a treatment, not a cure. Although patients may achieve long-term remission, even with focal or segmental vitiligo, there is always the possibility of reactivation of disease that patients should be aware of. Adjuvant treatments, including additional surgeries, may be necessary to achieve maximal repigmentation, especially if the treatment area was too large to complete in a single session or the degree of repigmentation after surgery is unacceptable.

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