

Nasal Reconstruction of the Leprosy Nose Using Costal Cartilage

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KEYWORDS

- Saddle-nose deformity • Leprosy
- Autogenous costal cartilage graft • Rhinoplasty
- Nasal reconstruction

Leprosy is a chronic granulomatous infection of the soft tissue of the skin and peripheral nerves that has plagued industrialized human populations worldwide for thousands of years. Leprosy remains a commonly occurring disease in some countries, with over 219,000 cases reported and a prevalence of more than one case per 10,000 people.¹ Unfortunately, despite medications that can effectively treat leprosy, it remains a difficult disease to detect, and diagnosis often occurs after the onset of several specific deformities. One of the most common manifestations of leprosy is the destruction of nasal cartilage. Interestingly, this disease universally preserves the skin, mucosa, and lower lateral cartilages of the nose.

Believed to have originated in the Indian subcontinent, the disease traversed the globe from Europe to Africa, along with the Far East and South America. However, since the description of the causative etiologic agent, *Mycobacterium leprae*, in 1873 by Gerhard HA Hansen, the disease has become concentrated mostly in resource-poor countries within tropical climate zones. Currently, 83% of recorded cases of the disease are found in only six countries: India, Brazil, Burma, Indonesia, Madagascar, and Nepal.² Because of the large immigrant influx into major metropolitan cities within the United States, coupled with leprosy patients frequently presenting with signs and symptoms of the disease long after leaving an endemic region, it is important that clinicians in the United States be able to diagnose and treat manifestations of this disease.

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Although there are numerous functional and cosmetic consequences secondary to lepromatous disease, perhaps none is more distressing or socially stigmatized than the development of a saddle-nose deformity. Inhalation of the mycobacterium allows for infiltration of the nasal mucosa and subsequent destruction of the bony and cartilaginous skeleton along with the mucosal lining.³ This process results in extensive remodeling of the nasal framework and significant ensuing deformities. Surgeons have proposed a variety of reconstructive techniques, which include nasolabial turnover flaps,⁴ post-nasal skin grafts,⁵ silicone rubber implants and other external prostheses,⁵ and most recently, autologous auricular and/or costal cartilage grafts.⁶ This article presents a case of severe saddle-nose deformity secondary to prior infection with *Mycobacterium leprae* (leprosy), and successful reconstruction with autologous costal cartilage grafts.

CASE REPORT

A 37-year old female born in the Dominican Republic, and a recent immigrant to the United States, presented with a complaint of complete nasal collapse. Her pertinent history began 7 years previously at age 30, when she sought medical attention from a dermatologist for multiple skin lesions developing on her upper extremities and trunk. A diagnosis of leprosy was made based on histologic evidence, and the patient was treated for several months with “multiple antibiotics.” Beginning in her mid-30s, the patient began to note progressive changes in the structure of her nose, along with significant nasal obstruction. Gradually, she noticed her entire nose “collapse.” Family members and friends had difficulty recognizing her. The patient does not report a history of other family members contracting or having been treated for leprosy in the past. The leprosy has been “quiescent” for a period of 2 years since her last treatments, the details of which she did not recall.

Physical examination demonstrated a woman with a severe saddle nose deformity and total nasal septal perforation. The patient had decreased tip support and recoil, which resulted in a bulbous, underprojected nasal tip. Aside from significant middle vault collapse, she also demonstrated deficient premaxillary projection (**Fig. 1**).

A nasal reconstruction was performed via an open rhinoplasty approach. Costal cartilage from two ribs—specifically the left seventh and eighth ribs—were harvested to repair her nose. Support of the nasal base was achieved with an extended columellar strut, carved from costal cartilage. The strut was carved to help project the nasal tip and augment the columella and premaxilla. The strut was not integrated with the residual septum (**Fig. 2**) Two interrupted permanent sutures were placed through the periosteum along the nasal spine to stabilize the graft (**Figs. 3 and 4**). In an effort to augment the premaxilla, several small pieces of costal cartilage (2 mm × 2 mm × 2 mm) were placed in a precisely made intranasal pocket and closed with 4-0 chromic gut sutures (Ethicon, Somerville, New Jersey).

A mild bony dorsal reduction was undertaken with a rasping technique to allow for a smooth platform for nasal dorsum augmentation. A thinly-sculpted dorsal onlay graft was placed over the nasal bones and upper lateral cartilages. The graft was carved from the soft central core of costal cartilage in an effort to mitigate the risk of cartilaginous warping. Furthermore, a moderately-crushed cartilagenous graft was placed over the middle third. Finally, the radix was augmented with remaining costal perichondrium (see **Fig. 4**).

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