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Pedicled Retrograde Fibula Flap for Ankle Reconstruction after Oncologic Resection of the Distal Fibula

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Sir:

Defects of the distal fibula can result in ankle instability.[1] Ankle reconstruction for defects involving the distal fibula include arthrodesis, nonvascularized autografts, and free flaps.[2] Pedicled flaps have some advantages over free flaps, including decreased operative time and decreased postoperative complications.[3] Pedicled retrograde fibula flaps have been previously described for tibial reconstruction, but to our knowledge, the use of a pedicled retrograde fibula graft based on the peroneal artery to achieve ankle joint stability after resection of the distal fibula has not yet been reported.[4,5]

The patient was a 6-year-old girl with Ewing's sarcoma of the distal fibula. A longitudinal incision was made from the fibular head to the distal portion of the lateral malleolus. The peroneal artery was preserved and dissected carefully both proximally and distally. A 13-cm portion of the distal fibula was resected 5 mm proximal to the physis.

After the tumor was excised, we needed a 10-cm-long bone to reconstruct the ankle syndesmosis. A corresponding 10 cm length of the ipsilateral proximal fibula was identified. We dissected out and clamped the proximal peroneal vessels, and then confirmed that there was still adequate perfusion of the foot and adequate retrograde flow into the flap. Once retrograde flow was confirmed, we divided the proximal peroneal artery and vein. An osteotomy was performed proximally preserving the common peroneal nerve and a small portion of the proximal fibula. The pedicled fibula was transposed to the ankle (Fig. 1). Special care was made to preserve as much venous branching as possible. Once the flap was inset, adequate flap perfusion and venous drainage were confirmed using a doppler.

To fix the transposed graft, a syndesmosis was then formed using a single 2 mm intramedullary K-wire,

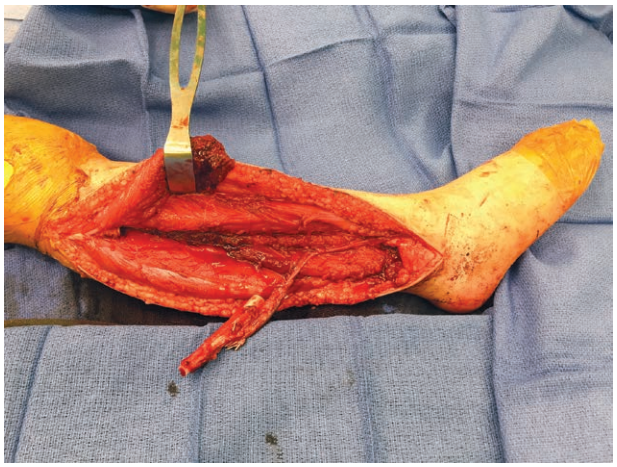

Fig. 1. A 10-cm segment of proximal fibula is dissected as a retrograde pedicled fibula flap for ankle syndesmosis.

Fig. 2. The transposed graft is synostosed using a 2-mm K-wire and a single 28 mm × 3.5 mm screw.

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which was then bent over and buried deep to the skin. After removing a small portion of the periosteum, the tibia was synostosed proximally via a single 28 mm × 3.5 mm screw, which was placed through all 4 cortices of the tibia and the autologous fibula flap (Fig. 2). The periosteum was then replaced over the graft to facilitate the synostosis to the tibia. Finally, a composite tendon transfer using 15 cm of the plantaris tendon and 11 cm × 1 cm of the Achilles tendon was performed by weaving these tendons into the proximal and distal remnants of the peroneus longus and brevis. Irrigation was performed and drains were then placed. The patient was placed in a posterior splint keeping the ankle in neutral position.

X-rays at 1 month (Fig. 2) demonstrated stable fixation, and at the patient's 12-month follow-up she was cancer free and ambulating without difficulty. The pedicled retrograde fibula flap is a novel autologous flap that can be used to reconstruct defects of the distal fibula. Care must be taken to preserve as much of the branching venous system and to confirm that retrograde flow through the posterior tibial connections to the distal peroneal artery exists before dividing the proximal peroneal artery.

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DISCLOSURE

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