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Calf restoration with asymmetric fat injection in polio sequelae

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KEYWORDS
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Summary *Background:* Many things cause leg asymmetry and sequelae seen after poliomyelitis infections are still a cause of leg deformities. In this study, lipofilling and liposuction combinations are performed on patients with poliomyelitis sequelae. Volume deficiency is not the only leg problem with polio sequelae, leg length is also a problem. For this reason, the length deficiency must be addressed in order to achieve the desired symmetry. The aim of this study is correcting limb asymmetry by a method addressing both limb length deficiency by heel raise and volume deficiency by injection of fat based on corrected limb length.
Patients and methods: From 2011 through 2013, 10 female patients who had unilateral leg atrophy as a result of paediatric polio infections were included in our study. All of the patients were treated with liposuction and lipofilling combinations. During planning, a ridge was placed under the affected leg in order to equalize the lengths of both legs. The fat injection sites on the affected leg were marked to mimic the unaffected leg.
Results: All the patients stated that they were satisfied with the results. Transient hypoesthesia was seen in only one patient, but this was spontaneously resolved six months later.
Conclusion: The study results indicate that the asymmetric fat injection procedure can be a good technique to use with patients who have polio sequelae, both with short legs and volume deformities.
Level of evidence: 4.

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Introduction

More patients who are demanding leg aesthetics procedures are being referred to plastic surgery clinics. For this reason, an increasing number of aesthetic leg operations are performed in plastic surgery practices. There are many causes of leg asymmetry, and sequelae that occur after poliomyelitis infections remain one of the causes of leg deformity.[1] Trauma, cerebral palsy, spinal cord injuries and tumour resections are other etiologies that affect leg symmetry.[1–4] The concept of addressing lower leg deformity by silicone implants was introduced in the 1970s by Carlsen.[5] Fat injections may be performed[6] or the leg may be reconstructed with free muscle and skin flaps in other treatment options.[7] In this study, lipofilling and liposuction combinations are performed on patients with mild to moderate asymmetries resulting from poliomyelitis sequelae. Volume deficiency is not the only leg problem with polio sequelae; leg shortness is also a problem. For this reason, the length deficiency should be addressed in order to achieve the desired symmetry. The aim of this study is correcting limb asymmetry by a method addressing both limb length deficiency by heel raise and volume deficiency by injection of fat based on corrected limb length.

While injecting the fat, we mimicked the ratios of the unaffected leg, and we neglected the ratios of the affected leg.

Patients and methods

From January 2011 to December 2013, 10 female patients who had unilateral leg atrophy as a result of paediatric polio infection were included in our study. Only patients with polio disease were included in the study because of length deficiency of the affected leg in addition to lack for volume. The right leg was affected in 4 of the patients and the left leg was affected in 6 of the patients. The circumferential difference between the two legs was more than 2 cm in all patients. Deformities with a circumferential difference of 2—4 cm were classified as mild. Deformities with a circumferential difference of 4—6 cm were classified as moderate. Deformities with a circumferential difference of more than 6 cm were classified as severe. Four patients were in the mild group, whereas 6 patients were in the moderate group. All of the patients were treated with liposuction and lipofilling combinations in order to achieve symmetry. The patients were invited to our clinic at 6 and 12 months after the last lipofilling sessions and were asked to complete a survey in order to assess their satisfaction. They were asked to rate their satisfaction from 1 to 5. The survey satisfaction rating scale was the following: 1 (poor), 2 (fair), 3 (good), 4 (very good) and 5 (excellent). Furthermore, maximum circumferences of the calves were measured preoperatively, at the 10th day (after oedema dissolution) and at the 6th month post-operatively to determine the improvement after fat injection.

The patients' clothing preferences were considered because a common preoperative statement among patients was that they wanted to 'wear short skirts,' as was also noted in Gutstein's study.[8] Clothing such as skirts or shorts expose the legs of the patients, and clothing such as tights or narrow pants emphasise their leg contours. The patients were asked about the percentage of time that they wore the aforementioned clothing. The post-operative changes in self-esteem and quality of life standards of the patients were surveyed. The patients expressed these changes as decreased, increased, or unchanged.

Operative technique

The donor and recipient sites of the fat grafts were determined and marked while the patients were standing. While planning, a small ridge was placed under the affected leg to equalize the lengths of the legs. Fat injection sites on the affected leg were marked by mimicking the unaffected leg. For example, areas such as the thinnest area right under the knee, the thickest area of the leg, the insertion point of the gastrocnemius muscle and the proximal portion of the ankle were accepted as references and relative lines were drawn. Injections were planned in order to equalize the areas between these lines (Figure 1). All of the patients

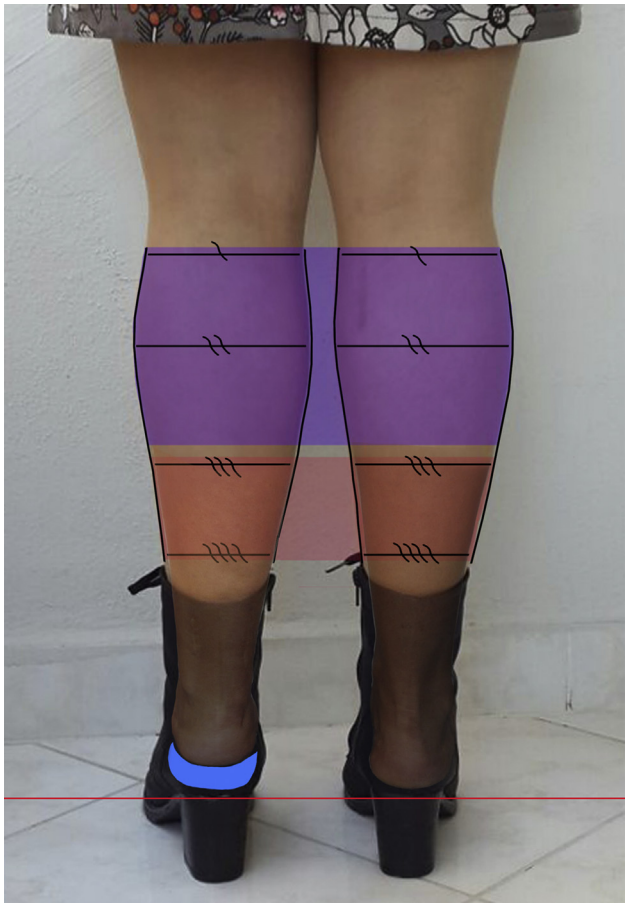

Figure 1 Asymmetric fat injection to the left leg and liposuction to the right one to achieve equal thickness at every level. For example, the appearance of the insertion point of the gastrocnemius muscle on the leg with the sequela is addressed in the same transverse plane with the insertion point of the gastrocnemius muscle on the normal leg while the patient is wearing shoes with hidden asymmetric sole plates. The length of the legs is equalized after applying the hidden heel. In this state of length equality, the purple areas in both legs and the orange areas under them should be equalized in volume.