ter publication from the same institution, following up many f the same patients (36).

More recent recommendations begin to stretch the extent which length can be restored, reflecting improvements in mb lengthening. Westin et al. (36) suggested amputation r any discrepancy that would be >7.5 cm at maturity (36). r Letts and Vincent (21), the number was >10 cm, and for ootnick et al. (95) it was between 8.7 and 15 cm.

Although modern prosthetics have made amputation a mewhat more acceptable alternative, the improved ability lengthen limbs has also made limb salvage a more feasible tion. The recommendations of Birch et al. are an effort account for these changes (76). They would recommend mputation for those with a nonfunctional foot, regardless of g length, unless the upper extremities were nonfunctional. r those with a functional foot, but a leg-length discrep- cy of 30% or more, amputation would be recommended. r those with a functional foot and a discrepancy of <10%, physiodesis or lengthening is reasonable. There is little dis- ement about these indications today.

It is between those two groups that the controversy regard- g treatment lies, and the greater the discrepancy in length, e greater the controversy. According to Birch et al., those ients with a functional foot and a discrepancy between 10% d 30% are candidates for either amputation or lengthening 6). The parents, who are the decision makers, are weighing e hope for their child to retain the limb against what that ll entail. Without knowing what a child with an amputa- n and prosthesis versus a lengthened limb is like, their first sponse is almost always to lengthen the limb. They most ely have never seen a child or adult with an amputation; y visualize something horrible. At the same time, they can- t really know what a lengthened limb will be like at the end treatment; they imagine the limb will be normal. Although ey may understand that they will need two or three length- ng procedures, they cannot know what the impact will be their child or their family, what complications they will counter on the way, or how their child will look or function the end of the treatment.

As yet, there are but a few preliminary reports of length- ng in fibular deficiencies with predicted discrepancies 0 cm. These preliminary reports, using the Ilizarov meth- s, deal mainly with the extent of length achieved, often fore maturity, but with little information on cosmetic and ctional result (96–100).

One way to begin to assess the problem is to look at what mount of length is required. The combined femoral and tibial gth for a girl of average height at maturity will be approxi- ately 80 cm (37) (Table 30.2). A 10% discrepancy would approximately 8 cm, a 20% discrepancy would be 16 cm, d a 30% discrepancy would be 24 cm. To achieve >10 cm of gth in a congenital limb deficiency with AP knee instability, kle instability, foot deformity, and congenitally short soft tis- es are a significant undertaking (100–102).

Reports comparing Syme amputation with lengthening e few and incomplete, but begin to give an appreciation of the problems associated with lengthening severe deficiencies (71, 103–105). These reports conclude that lengthening should be reserved for those with more normal feet and less discrepancy in length, although early Syme amputation is the best treatment for the more severe problems. Herring gives a philosophical perspective on the dilemma (106). Birch et al. (107) reviewed a series of adults who were treated with Syme amputation in childhood. These authors conducted physical examination, prosthetic assessment, psychological testing, and physical performance testing and commented that the results of multistaged lengthenings for this condition would have to match these results to be justified. They currently offer lengthening to patients whose limb-length discrepancy is 20% or less.

Bilateral. In patients with bilateral fibular deficiency, the three problems are the foot deformity, the discrepancy in length between the two limbs, and the overall shortening in height because of two short limbs. Without extenuating circumstances (e.g., nonfunctional upper extremities), disarticulation of the foot and prosthetic fitting is the best solution. For those children with nonfunctional upper extremities who will use their feet for many of the activities of daily living (ADL), amputation of the feet is not an option.

In children with bilateral fibular deficiency, there is usually little discrepancy between the two limbs, but rather a discrepancy between their height and what their normal height should be. As they enter into their peer group, this becomes an increasing problem. This problem is most easily solved by the prosthetist. If there is a significant difference between the length of the two limbs that cannot be solved by prosthetic adjustment, lengthening of the short limb becomes an attractive option.

Syme and Boyd Amputation. The amputation described by Syme (108) seems to have been accepted for adults before it was accepted for children, and its use in boys was advocated before its use in girls because it was said that the Syme amputation produced an unsightly bulkiness around the ankle. This resulted in many children receiving a transtibial amputation rather than a Syme amputation. It was subsequently learned, however, that the ankle does not enlarge following amputation in a young child, and the cosmetic appearance is excellent as the child grows.

Thompson et al. were the first to recommend the Syme amputation, rather than transtibial amputation, although only as a last resort (91). Subsequent reports by Kruger and Talbott (93) and Westin et al. (36) not only confirmed the advantages of the Syme amputation in both boys and girls but also advocated its early use for severe deficiencies. Several studies now confirm the value of Syme amputation (90, 93, 106, 109–113).

One of the major advantages of the Syme amputation is the ability to bear weight on the end of the residual limb. This is important both for prosthetic use and for instances in the home when the child will walk short distances without the prosthesis (for instance, going to the bathroom in the middle of the night). It is also relatively technically easy to perform.