New development in hallux valgus surgery

Minimally invasive technique

Hallux valgus surgery is one of the most common operations in foot surgery and due to very intensive training and technical developments it has reached a standard with specialists that usually delivers good results in about 90 percent of patients. One problem, as the patient see it, is that the operation is perceived as very painful. In addition, due to sweating and microbial colonization of the skin of the foot in particular, there may be delayed wound healing and even infections with considerable complications.

What are the determining factors for developing hallux valgus?

Apart from a genetic predisposition, the causes of development of hallux valgus (Fig. 1) include above all footwear that has little room for the toes, especially in women wearing high heels with pointed toes, which take no account at all of the anatomic features of the forefoot. Because of the high heels, there is overloading of the metatarsophalangeal joint of the big toe, which sometimes has to sustain 10 to 15 times the body's weight.

Three factors lead to development of hallux valgus:

The increase in rotation of the toes, the reduction in the tension of the medial ligaments and lateralization of the big toe cause the extensor hallucis longus to force the big toe laterally. This results in a change in the angle of traction, which can no longer be corrected by conservative measures. Naturally, the development of hallux valgus is also associated with the alteration in tissue texture with increasing age, which gives way more and more with a slight change of alignment, thus leading to severe hallux valgus. Subsequently, the bunion presses against the shoe. This produces inflammation and a bursa, which gradually lead to constant pain. The time has then come for the patient to seek medical assistance.

Conservative treatment:

Conservative treatment had little to offer until now as patients already have considerable deformity when symptoms occur. The splints available to date exhibit extreme rigidity so that they do not allow gradual correction of the shortened structures. This is why symptomatic treatment consists primarily of wide footwear, anti-inflammatory medication and foot exercises with abduction of the big toe.

Figure 1: Hallux valgus

Our study in 50 patients treated with the Halluxsan splint (Fig. 2) shows a marked improvement in 80 percent of patients with moderate hallux valgus with slight deformity and with flexible hallux valgus. The Halluxsan splint does not have to be worn continuously but only for hours at a time, and possibly overnight also. The Halluxsan splint is the only available Quengel splint for hallux valgus. Since the pathological

Figure 2: Halluxsan® splint

Figure 7a+b: Radiographs of hallux valgus before the operation
(a) and after minimally invasive correction (b)

Figure 8: 2 weeks after hallux valgus correction and tenotomy to elevate the claw toes

three months. The Halluxsan splint should be worn at home for support during periods of rest and during the night in the first six postoperative weeks.

Conclusion

The minimally invasive technique requires extensive debate and appropriate courses. As in many other orthopedic areas, minimally invasive surgery will undoubtedly be the future for moderate hallux valgus. Whether a minimally invasive technique is feasible in an individual case should be assessed by an experienced specialist and carried out in corresponding centers with the necessary experience.

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be changed with this measure, continuous improvement of the situation must be additionally supported with appropriate footwear and limited wearing of high heels. The Halluxsan splint can also be used in preparation for surgery to attain a better preoperative condition.

Surgical management:

Surgical management follows an algorithm that takes into account the different degrees of severity and instability of the hallux valgus. Besides chevron osteotomy, which gives very good results with moderate deformities, greater deformities can also be corrected by a further modification known as the scarf osteotomy, a standardized and promising technique. The hallux valgus is corrected by division of the first metatarsal, which is fixed by means of screws or wires.

The minimally invasive technique:

In recent times, a trend to minimally invasive procedures has become established. In our experience, this provides optimal possibilities especially in surgery of moderate hallux valgus. The adductor muscle along with the lateral capsule is mobilized laterally through a small access in the intermetatarsal space to enable translation of the metatarsal head into the correct position (Fig. 3).

Figure 3: Lateral mobilization of the capsule and adductor muscle

Figure 4a: Large skin incision with the conventional technique

Figure 4b: Very small skin incision with the minimally invasive technique

Hallux valgus deformities can be corrected minimally invasively and sparing soft tissues through small incisions of only 4 to 5 mm (Fig. 4a+b) using suitable special instruments (Fig. 5a+b). Through a stab incision about 5 mm long in the region of the hallux the dorsal and plantar capsule is divided with a special rasp (Fig. 5a) and protruding bone is milled off (Fig. 5b). Under image converter control a guide wire for the osteotomy is introduced and the chevron osteotomy is then performed in the classical manner using a special bur (Fig. 6). The head is then mobilized and pushed laterally under image converter control to achieve optimal covering of the sesamoid resulting in optimal correction (Fig. 7a+b).

The corrected position is then fixed temporarily with a transfixion wire and stable fixation of the osteotomy is then obtained through a cannulated screw. Since there is only a small breach in the capsule, no further sutures need to be placed so there is no tightening and therefore

Figure 5a+b: Minimally invasive correction of hallux valgus using special instruments

postoperative stiffness. Because of the screw fixation, the toe can be moved immediately.

Postoperative treatment:

Because of the small access patients have much less postoperative pain. The risk of infection is reduced to a minimum. The duration of hospitalization is also shortened. A special shoe with forefoot support with full loading is worn during the day for four weeks postoperatively.
Physiotherapy and independent exercising lead to increasing load-bearing. Jogging is usually possible after three months. Compared with the major procedures, swelling of the soft tissues has resolved almost completely after

Figure 6: Milling in the minimally invasive technique