

## Anterior Subtalar Dislocation: Case Report

Suguru Inokuchi, Takeshi Hashimoto, and Norio Usami

*Department of Orthopaedic Surgery, School of Medicine, Keio University, Tokyo, Japan*

**Summary:** Anterior subtalar dislocations are extremely rare. To our knowledge, only four cases have been reported in detail in the literature. A diagnosis of anterior subtalar dislocation should be confirmed by an anteroposterior view radiograph because lateral subtalar dislocation always includes some anterior displacement of the mid-foot. We report a case of anterior subtalar dislocation confirmed by both lateral and anteroposterior view radiographs and discuss its pathomechanism, diagnosis, and treatment. **Key Words:** Dislocation—Subtalar joint, anterior—Talonavicular joint—Talus.

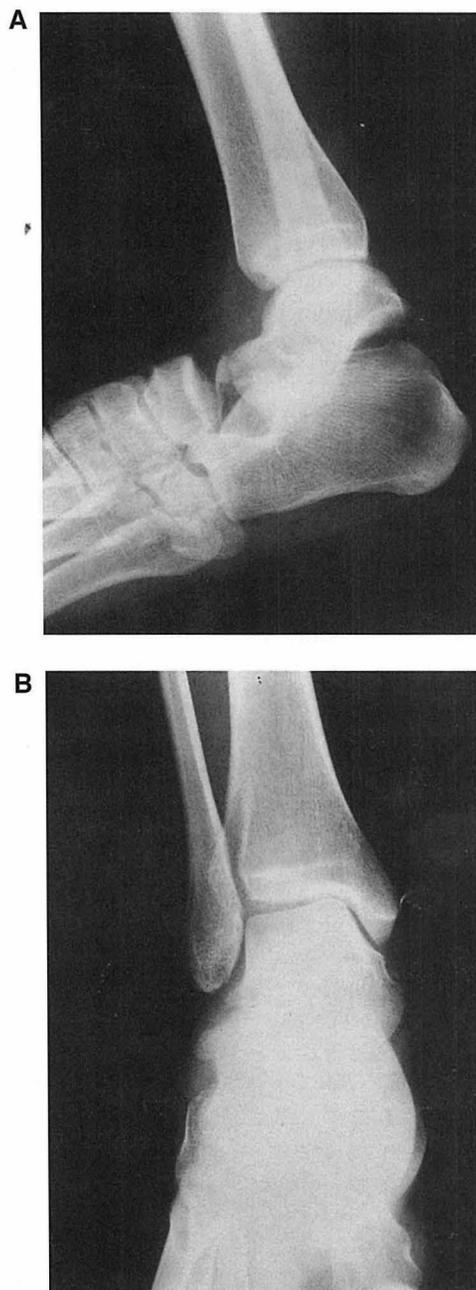
### CASE REPORT

A twenty-four-year-old man fell off his motorcycle and injured his left ankle. A lateral view radiograph of the injury showed dislocation of both the talonavicular and subtalar joints, whereas the anteroposterior view showed both an anterior and a slight lateral displacement of the mid-foot (Fig. 1). Anterior subtalar dislocation was diagnosed according to Broca's criteria. Radiographs also showed minor fractures of the head of the talus and the cuboid bone. After placing the patient under lumbar spinal anesthesia, we immediately performed a manual reduction, which was easily attained by applying traction to the foot in the posterior direction with the knee in flexion and the ankle in plantar flexion.

The patient's ankle was immobilized for three weeks, after which the patient was assigned to active range of motion exercise when the cast was removed; full weight bearing was allowed at six weeks. Three years after the injury, the ankle joint's active range of motion measured 15° in dorsiflexion and 50° in plantar flexion (the patient's right ankle joint displayed 20° and 60°, respectively); the active range of motion of the subtalar joint was 15° on the left side and 30° on the right. Plain radiographs showed no evidence of aseptic necrosis of the talus or arthrosislike change of subtalar and ankle joints. The patient had no complaints and returned to his previous job.

### DISCUSSION

In 1852, Broca (2) classified subtalar dislocations into three types, according to the direction of displacement of the foot in relation to the talus: medial, lateral, or posterior. In 1856, Malgaigne (5) reported the first case of an-



**FIG. 1.** **A:** Lateral view radiograph showing that both the subtalar and talonavicular joints are dislocated, the foot is displaced forward, and the body of the talus is stranded on the calcaneal tuberosity. **B:** Anteroposterior view radiograph of the ankle shows that the foot remains under the talus without considerable lateral displacement.

terior subtalar dislocation, adding an anterior type to Broca's original classification system. Zimmer (13) reported that anterior dislocations are infrequent, accounting for only 1% of all subtalar dislocations; medial dislocations are by far the most common, accounting for

79.5% of all cases, with lateral dislocations comprising 17%, and posterior dislocations 2.5% of the total.

Much of the literature on subtalar dislocations has relied on limited or incomplete data. Shands (8) in 1928 reviewed 139 cases of subtalar dislocation, including six cases of anterior subtalar dislocation. None of the six cases was accompanied by details or radiographs, and only two, those of Thienhaus (10) and Smith (9) provided references. In the former, the dislocation was not confirmed with an anteroposterior view radiograph, whereas the latter case injury was in fact a peritalar dislocation, not a subtalar dislocation, because the talocrural joint was dislocated along with the subtalar and talonavicular joints.

Although incomplete, Shands's review served as the basis of later reviews. In his report of an old anterior subtalar dislocation, Nakano (7) (in 1947) relied on a sketch of the lateral view radiograph. Watanabe (11) (in 1959) and Yamamoto (12) (in 1964) each reported a case of anterior subtalar dislocation without providing an anteroposterior view of the ankle that could substantiate their diagnoses. Delee (3) (in 1982) reported one case of anterior subtalar dislocation without details or radiographs, and Mitroszewska (6) (in 1992) reported one case of subtalar dislocation. Table 1 lists the cases of anterior subtalar dislocation that have been reported in detail.

Bonnin (1) (in 1950) dismissed reports of anterior subtalar dislocations as doubtful because all were reported in the "pre-radiological era." Fahey (4) (in 1965) asserted that posterior and anterior subtalar dislocations are usually considered part of the displacement of medial and lateral subtalar dislocations. Therefore, he stated that a diagnosis of anterior subtalar dislocation should not be made unless the absence of considerable lateral displacement has been confirmed on an anteroposterior view radiograph of the ankle. Anterior and posterior dislocations always include some degree of lateral or medial displacement, and medial and lateral dislocations always exhibit some degree of anterior or posterior displacement.

Therefore, we propose that subtalar dislocations in which the foot is mainly displaced forward and the posterior subtalar facet of the talus is stranded on the calcaneal tuber be diagnosed as "anterior subtalar dislocation," even if there is slight lateral displacement of the foot on frontal view radiographs and the talus is partially superimposed on the calcaneus on the lateral view.

The cause of anterior dislocation is anterior traction of the foot that first tears the interosseous ligament and the lateral and medial ligaments of the ankle joint, and then strands the posterior subtalar facet of the talus on the back of the calcaneal tuber. The prominence of the posterior margin of the posterior subtalar facet of the calcaneus fits into the sulcus of the talus. One of the reasons for the rarity of anterior dislocation of the talus may be its low probability of exposure to violent force in this direction; another reason may be the anatomical stability of the subtalar joint in the anteroposterior direction. It is also important to note that because the position of such fractures is unstable, anterior subtalar dislocations can readily become reduced naturally, and may even dislocate laterally again, becoming lateral dislocations.

Repositioning subtalar dislocations is relatively easy if there is no interposition of tendon or bone fragments. Delee (3) recommended early closed reduction of the injury followed by immobilization for three weeks, then active range-of-motion exercise of the subtalar joint after cast removal. We treat subtalar dislocations in a similar manner, and allow full weight bearing after an additional three or four weeks. Although results have been good despite the slight restriction in subtalar and ankle joint motion, longer follow-up is necessary to verify the long-term success of this treatment.

## REFERENCES

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TABLE 1. Anterior subtalar dislocations

Investigators (yr)	Sex/ Age (yr)	Cause	X-p lateral	X-p A-p	Open or closed	Associated fractures	Treatment	Period of immo- bilization	Follow-up term	Outcome
Thienhaus (10), 1906	M/37	Fall from height	+	-	Closed	Lateral malleolus	Removal of talus		4 mo	No pain
Nakano (7), 1947	M/23	Auto accident	Sketch	-	Closed		Open reduction	3 wk	7 mo	No pain
Watanabe (11), 1959	M/21	Cave-in	+	Foot	Closed		Closed reduction	5 wk	4 mo	No pain
Yamamoto (12), 1964	M/48	Direct blow	+	-	Closed		Open reduction	12 wk	8 mo	No pain
Inokuchi, 1996	M/24	Auto accident	+	+	Closed	Chip of talar head and cuboid	Closed reduction	4 wk	10 mo	No pain

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Address correspondence and reprint requests to Dr. Suguru Inokuchi, 6-6-7, Honkomagome, Bunkyo-ku, Tokyo 113, Japan.