

OPERATIVE TREATMENT OF TUBERCULOSIS OF THE ANKLE-JOINT AND TARSUS*)

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Here, it is not my aim to raise any discussion of the value of heliotherapy with solar light or arc light in tuberculosis of the ankle-joint and tarsus. («La cure solaire à l'altitude guérit la tuberculose externe sous toutes ses forms, à tous les degrés et à tous les âges». Rollier.) A functionally satisfactory foot may no doubt be obtained by a large percentage of patients who have time and money enough for a hospital treatment that is often very protracted and sometimes lasting for years, which a heliotherapy may require in such cases in order to be really effective. But this treatment is altogether out of the question for a great many patients.

It should not be necessary here to mention the worthlessness of the *so-called* heliotherapy which is now in vogue. Because of some cases I have seen, however, I may say this much, at any rate, that no physician ought to recommend or institute any heliotherapy in tuberculosis of the foot unless a real treatment can be carried through, technically and economically. It is not enough to give such patients 25 or 30 hours of arc light; and it is more insufficient yet to give them ambulatory heliotherapy, or tell them to »sun« their foot while hobbling about on crutches. If real heliotherapy cannot be carried through, some other effective treatment has to be instituted.

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What I want to do, is to remind you by my remarks and by a few slides that *we have* such other treatment. We have other methods beside heliotherapy, splendid methods, the results of which may well stand comparison with the results of the real heliotherapy; and they have the advantage over heliotherapy in this, that they keep the patients in bed and in hospital for a far shorter time, or even not at all.

This fact makes these methods valuable, in particular to patients who — for economical, social, or other reasons — *cannot* obtain effective heliotherapy, and whose scanty time and money, or the limited help from the sick-benefit club, now in a deplorable number of cases are wasted on courses of sudorifics in some »Institute for Heliotherapy« — whereafter they are left moneyless and helpless, with the foot worse than it was before the »treatment«. These methods are valuable also to patients who have the means to pay for heliotherapy, but are unwilling to stay in bed for years in a hospital — nor should they be advised to so. »Why should the well-to-do patients be denied the advantages from the progresses that have been made in the treatment of the less prosperous patients?« (Schw. med. Woch., 1928). It is largely the fault of the surgeons that matters stand so. Under the pressure of the prevailing ray-fashion it seems as if many surgeons have almost felt ashamed of being oldfashioned enough to make use of knife and plaster instead of rays. They seem to have forgotten how quickly, comparatively, a patient with a tuberculous foot may be put on his legs by thorough orthopedic surgical treatment.

In tuberculosis of the knee — all heliotherapy notwithstanding — resection has long ago been restored to honour and glory, to the great benefit of the patients. It is about time, now, that the same should apply to tuberculosis of the foot. Astragalectomy, atypical resections, tarsectomy, sequestrotomy, etc., ought again to get their well-deserved »place in the sun«, in the case of children as well as adults; and, in adults, this holds equally good of amputatio cruris — an operation which does at once as much good as expensive heliotherapy for months and years in cases of tuberculosis of the foot with extensive fistula

formation and mixed infection, cases where preservative surgery is hopeless. *A well-resected foot is just as good in use as is one cured by rays*; a good prothese on a good stump is better than a bad foot which keeps its owner constantly in bed — with due respect for the plumpness and healthy complexion that may be obtained and preserved with heliotherapy. Most of our patients have to earn their living *by the use of their limbs*, and cannot afford to live for them. For some years, now, resection has been used too little and too late, and often amputation has been delayed too long.

Nor should »plaster« be forgotten. Many patients with tuberculosis of the foot may be cured by treatment with ambulatory bandage, practically without hospital treatment and altogether without heliotherapy — that is, without interrupting their housework, job, or study, provided they are under observation and are living under tolerable hygienic conditions.

Heliotherapy — *i. e.* sun or are light — alone, or combined with immobilising and supporting bandage treatment, should be reserved for very early lesions in which the tuberculosis cannot be made out for sure, and for advanced cases in which the lesion is too extensive to be removed by operation. Heliotherapy should be employed as a supporting measure in the treatment of severe and »multiple« lesions in patients whose general condition is bad; and such patients *ought* to be kept in bed. Moreover, it forms a splendid consolation for patients who do not want to submit to an indicated amputation, and who *must* be kept in bed.

Operation, on the other hand, should be performed when the tuberculous process is fully developed and has been localized on X-ray examination — but only when a radical operation does not remove too much of the bony structures for making a serviceable foot of the rest. And the operation should be performed before the muscles have been damaged, before the lesion has gone on to complication with fistula formation and mixed infection, before the general condition of the patient has become so bad that *it alone* necessitates confinement to bed in hospital and radiotherapy for an incalculable period — if, indeed, it be possible to avoid an amputation.

The successful result of operative treatment is primarily contingent upon the condition of the patient, whether he has the necessary power of reaction, or may be able to build up this power on preliminary treatment (no objection to light treatment!); and operative measures should not be employed in the florid stage of the lesion. Secondly, the operation should be made so radical that the lesion of the foot will no longer be a tuberculous condition, but an orthopedic lesion. Last, not least, the after-treatment should be continued long enough — after orthopedic principles.

The radical operation — *i. e.*, the complete removal of the local process — is only the first step in the treatment; the next is to frame the stump of the foot, and to support it till it is capable of carrying; and the muscles of the calf and foot should be made efficient, or put out of function, by immobilization with permanent bandaging of the foot or ankle-joint, as long as indicated.

The orthopedic after-treatment begins immediately after the operation and, as early as a couple of months after the operation, it may be ambulatory, allowing the patient to do many kinds of easy work.

The truths I have here called to mind, are old truths. Ollier called attention to them in 1895, and others have done so afterwards. But, through the change in fashion, these truths have now been long in the shade; and I am convinced they ought to be brought to light again.

I have myself treated tuberculosis of the foot after these principles ever since 1894, first 17 years in Fredriksvern, then 18 years in Oslo. I operate for foci in the calcaneus, malleoli and lower tibia as soon as they are localized by X-rays. Making such patients waste months and years on heliotherapy of sequestration is mala praxis — or, at any rate, unreasonable (Eivind Nielsen, p. 6). I also operate as early as possible in talocrural and tarsal tuberculosis. In these lesions I have always, for a good many years, made an incision across the dorsum pedis — Hue-ter's incision — as far as required in each particular case, through tendons and nerves, without suturing these — on the

whole, with as few sutures as possible, but with antiseptic tamponade, till I am sure that the wound cavity is clean from the bottom. Splints and soles are employed in the after-treatment, till the foot is free of pain and capable of carrying without support. It is surprising how quickly the supports may be discontinued; but in some cases it may be necessary to extend their use for a long time — as in club foot, for instance. The results have been satisfactory; if otherwise, I would not have kept on with the method.

From the records of my work in Fredriksvern (1894—1911) I see that in children up to the age of 15 years, I have amputated the leg in 3 cases, made resection in 28 cases, chisseling and sequestrotomy in 24 cases. After leaving the Coast Hospital, I have made after-examination of these cases only occasionally, but I claim that my treatment of them was satisfactory and useful surgery.

In my Oslo-material of patients with tuberculosis of the foot, several are to be left out because the treatment was interrupted — as, for instance, four patients operated in the State Hospital, three of them contracting pulmonary tuberculosis, and one meningitis. The treatment was carried through in 28 cases, mostly adults. (I have treated 19 of these myself. In the remaining 9 cases, resection is done in 7 — six in Oslo and one in Moss — while amputation is performed in 2, one in Drammen and one in Fredriksvern.) In the total material, resection is done in 14 cases, excochleation in 5, and amputation in 6, while 3 are treated conservatively. Deducting the 6 cases of amputation and 3 cases treated with plaster cast leaves 19 cases of preservative operation to be estimated. All these 19 patients were operated only once, and they all got well; on after-examination the lesion was found to be cured in all of them, and in general they showed a good function of the foot. The observation time for these Oslo patients varies from 3 to 18 years.

The stay in hospital has lasted from one month to four months, averaging 68 days.

The figures are low. To calculate them in percentage is no

use, but I think they may be quoted as commendatory of operative treatment in suitable cases.

Beside my own Oslo patients I have included in this material, two very fine cases which Dr. Nannestad has operated on, and which he has kindly allowed me to present, and, in addition, five cases which I operated on in Fredriksvern.

Want of time, unfortunately, prevents me from demonstrating the patients. I have to be content to show some slides, hoping that they too may contribute to arouse some interest for surgical orthopedic treatment of tuberculosis of the foot. In favorable results this treatment is fully equal to any other treatment.

Before showing the slides, I would like briefly to give three case-records which illustrate — without pictures — what I have characterized as useless heliotherapy.

First one case where the treatment was excellent in itself but had to be discontinued, as the patient could not keep on sparing the time, which the treatment requires, without great harm to her house which she had to keep.

The two other cases where the heliotherapy, which had been advised, did not do any good but merely prolonged the invalidity of the patients.

I. Baker's wife. At age of 21: pleurisy. Afterwards married, healthy; four children. 29 years old: influenza. After this, pains in left foot, with fistula formation. In one hospital, plaster or operation was advised. She then went to another hospital where she was treated with phlebostasis, X-rays, arc light and potassium iodide. After some months, she discontinued the treatment when she learned that it was yet to last for a long time; she could not stand her home being ruined while she was staying in hospital. Then, for a time, she nursed her foot herself the best she could. She came to me on Nov. 3, 1924, at an age of 32 years. She had not been able to tread on the foot for two years; she had walked with a cane and a crutch. She entered my office hopping on one foot, her usual way of moving about in the house.

She had fistulous tuberculosis of left os naviculare. I suggested an operation, but she had no time for two or three months' stay in hospital. She was then instructed in keeping the wound clean and got a supporting knee-guard, and a leather splint on the foot.

May 23, 1925, the foot was without pain. She wore the splint outside as well as in the house. Then she did not return for 1½ year; but, when I wrote, asking her to come, she came on Febr. 29, 1926. The fistula was solidly healed; the foot was firm, without any tenderness or pain. During all the time she had been using the splint, she had managed to do her housework without any help.

Sept. 9, 1929, she came back, at my request. For 3 years, now, the foot has been whole and free of pain; it is now fixed in valgus. The fistular scar is solid. She is a good walker, and feels perfectly well.

II. Male, 25 years old. May 25, 1924. Previously good health. Field-artillerist. In 1922, after influenza, he grew thin and weak and had pains in right heel. In 1923, the heel was swollen, with fistula formation along the peroneal tendons.

Heliotherapy for one year, of no avail. Diagnosis: Tuberculosis calcanei with tuberculous tenosynovitis fistulosa of the peronei. The skin is dark brown after the heliotherapy; the foot is disabled.

May 30, 1924. Sequestrectomy, cleaning out of the tenosynovitis. After some months of ambulatory and painless treatment, the foot was whole in November. April 24, 1926 a slight relapse of tenosynovitis, which is cured in three weeks. After this, perfectly well.

III. Fisherman, 22 years old. Nov. 7, 1926. Talocrural tuberculosis during past 3 years, with 100 per cent invalidity. Had first been kept in bed and plaster for 8 months. Afterwards he had been out of bed for 2 years, with a crutch, and told to »sun« the foot. He was then admitted to the Surgical Department of the State Hospital. Resection of talus, etc. Discharged

after 3 months, with a splint. 3 months later, he was able to walk about without a cane and to work on a farm — without any pain. Present invalidity: 35 per cent.

Next I shall show the slides of 16 patients with tuberculosis of the foot. With one exception, they were all treated by me, six of them in Fredriksvern. One of these was treated conservatively; the rest were all operated on — 14 by me, and 2 by Dr. Nannestad who has kindly allowed me to use the X-ray plates of these two cases in this demonstration.

The operations have been: Resection of the foot, 2 times (on one patient who had tuberculosis in both feet); astragalectomy, 9 cases; mediotarsal resection, 5 cases.

The expediency of astragalectomy is recognised universally; and it is corroborated by my cases too. Mediotarsal resection, on the other hand, does not meet with such a general estimation of safeness; for it is feared that it may leave the foot in a bad shape. The five cases I am to show here, however, will prove that this fear is not justified. All five patients have good feet.

That even such a radical operation as *resectio pedis* may give a good result — functionally, if not anatomically — is demonstrated by the last case.

Casuistics and text to figures:

Case 1. Ellida P., born 1894. In 1912, tuberculosis of talocrural and talonavicular joints. July 20, 1912: *Astragalectomy*. Sept. 30, 1912, discharged, with fenestrated plaster cast (after 2 months in hospital). On after-examination, June 21, 1929, she said: »Since the operation I have never had any pain in my foot; I walk well on it, just as well as on the other foot.« X-ray plate 1.

Case 2. Solveig H., born 1897. In 1920, Spanish influenza, whereafter several joints were swollen. Swelling of left foot. May 18, 1921, no pains. In July, fistula formation. Sept. 13, 1921: *Astragalectomy*. Nov. 1, 1921, begins to stand on the foot. Dec. 12, 1921, discharged, after 3 months in hospital, with fenestrated plaster cast, which she used till May 1922. On after-exam., March 12, 1927: Foot well since operation. She walks well, fast and far. The foot in 90° position; it may be flexed actively and strongly a little further; good sensibility below the scar. X-ray plate 2.

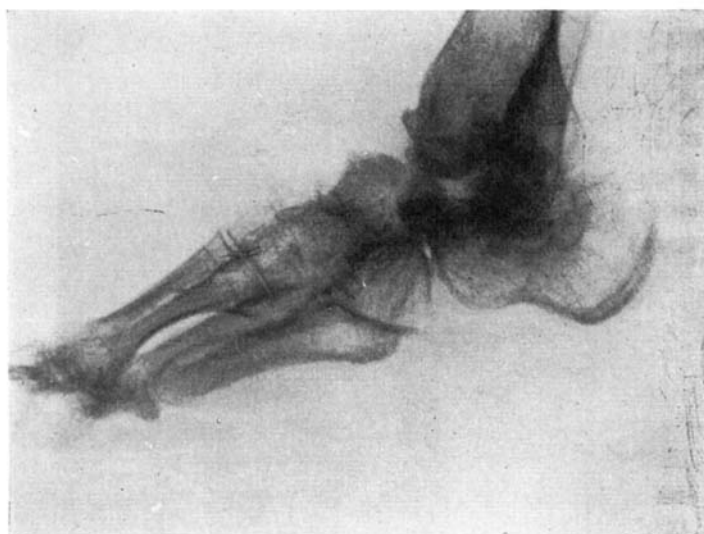


Fig. 1.

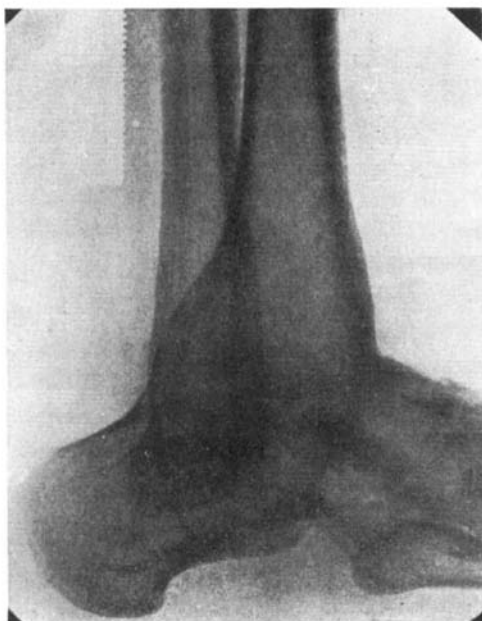


Fig. 2.

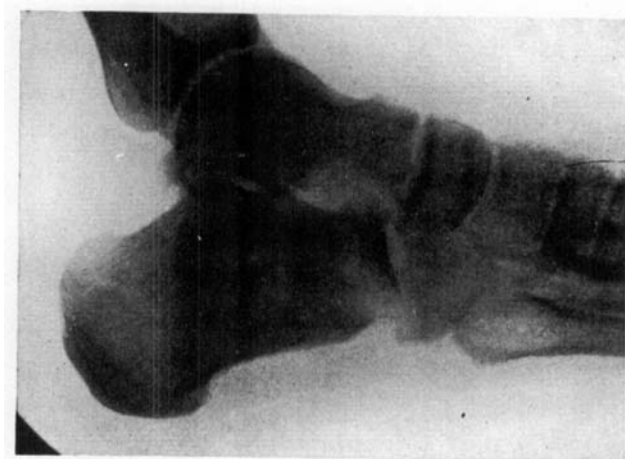


Fig. 3.

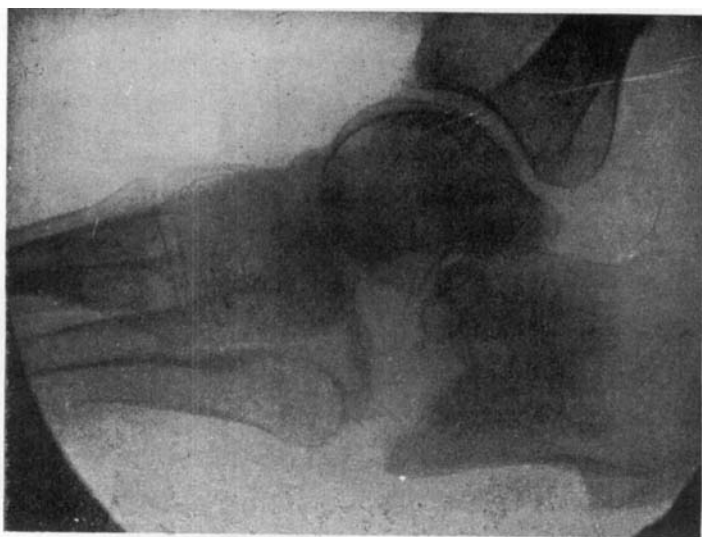


Fig. 4.

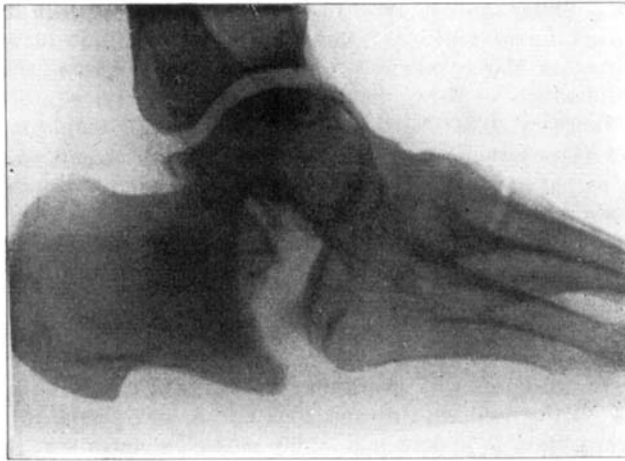


Fig. 5.

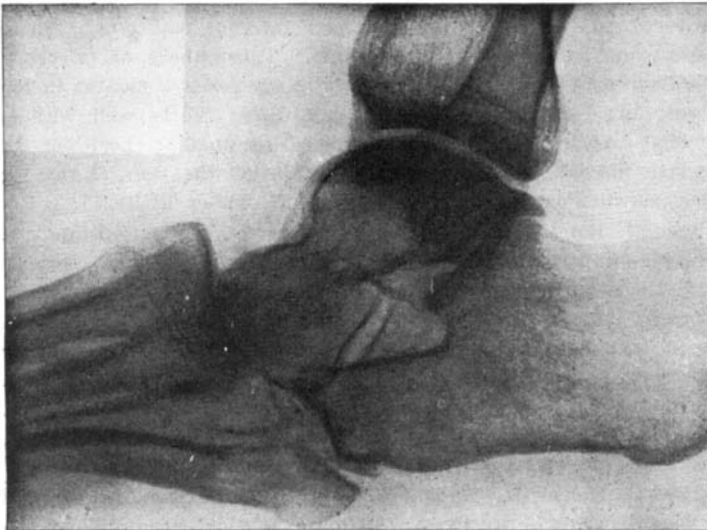


Fig. 6.

Case 3. Birger S., born 1883. In November 1921, some pain in the foot under the external malleolus; X-ray plate negative. May, 1923: Trauma of the foot in March followed by a swelling, which was incised; then fistula formation — X-ray plate 3. *Mediotarsal resection*. In hospital 2 weeks. February, 1924: Walks with a cane, a small fistula in the scar — X-ray plate 4 shows destruction of bone in anterior part of calcaneus and in os cuneiforme. February 1926: Walks well and much; uses a cane »as a matter of prudence«; the scar is fine; good sensibility below the scar. Rectangular position with slight dorsal and plantar flexion. No ulceration; no pain. X-ray plate 5. 1929: Foot healthy and strong; pt. walks long distances without a cane.

Case 4. Jakob N., born 1888. June 26, 1923: Swelling of the foot since August, 1922; now fistula. *Mediotarsal resection*. One month in hospital; discharged with bandages. September 28, 1923: Complete healing. April 28, 1924: Walks well with a cane. February 3, 1925: Foot efficient and firm. X-ray plate 6. In 1929, his family physician states that the foot is in excellent condition.

Case 5. Magda E., born 1889. September 3, 1924: Tarsal tuberculosis with fistula formation. *Astragalectomy*. 42 days in hospital. May 14, 1929: No pains in foot, which is strong and efficient (Dr. Nannestad). X-ray plate 7.

Case 6. Ingrid F., born 1899. At the age of 8, lesion in left foot, associated with moderate pains, which subsided gradually. At the age of 20, pains in the foot; curetting under internal malleolus, followed by recovery. In spring 1924, return of pains. Treated with heliotherapy, and recovered. March 1925: Abscess under internal malleolus; puncture of abscess and heliotherapy. X-ray exam.: Tuberculosis of talocrural and talocalcaneal joints. June 4, 1925; *Astragalectomy*. 2 months in hospital. August 15: Leather bandage. April 23 1926: Walks well with leather bandage. April 25, 1927: Foot firm, rectangular position. Leather bandage discontinued. Good sensibility below the scar. X-ray plate 8. (Demonstrated in Oslo Surgical Society December 12, 1927).

Case 7. Randi L., born 1900. February 21, 1923: Constant pains in left foot for past $1\frac{1}{2}$ year, pains in right ulna for past $\frac{1}{2}$ year. June 9, 1923: Curetting of tuberculous focus in ulna; healed. Foot treated with iodoform, later with Bier's stasis; potassium iodide prescribed, but disagreed with her. Leather capsule from June 1924. After improving for some time, pt. was getting worse again. March 6, 1925: *Astragalectomy*, pus in the joint. 34 days in hospital. February 11, 1928: Foot efficient; she walks firmly and without tiring. Good mobility. X-ray plate 9. (Demonstrated in Oslo Surgical Society, December 12, 1927).

Case 8. Helene F., born 1909. May 18, 1925: Swelling of right foot for past $\frac{1}{2}$ year. X-ray exam.: Mediotarsal tuberculosis. X-ray plate 10. Plaster cast and crutches. November 11, 1925: Condition worse. *Medio-*



Fig. 7.

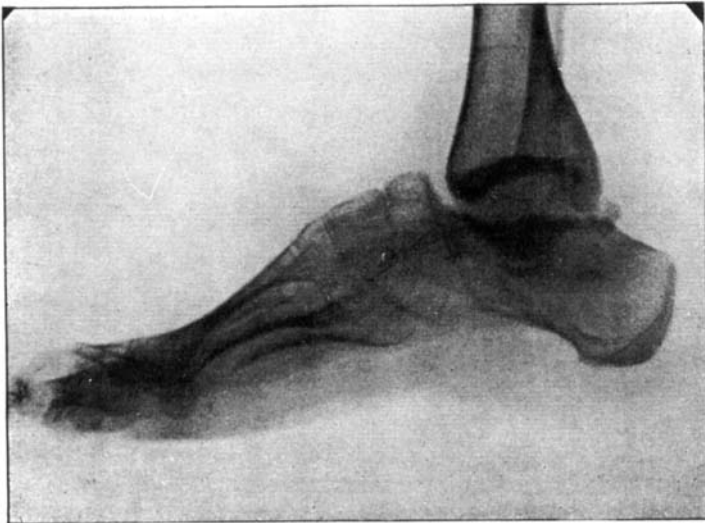


Fig. 8.



Fig. 9.

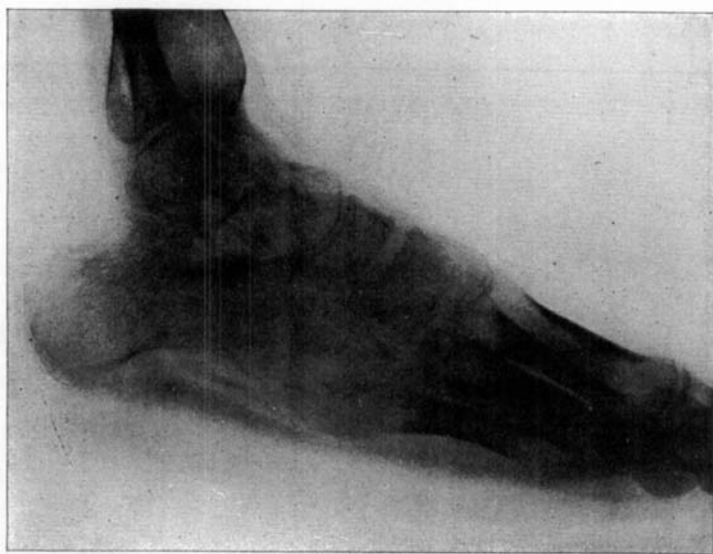


Fig. 10.

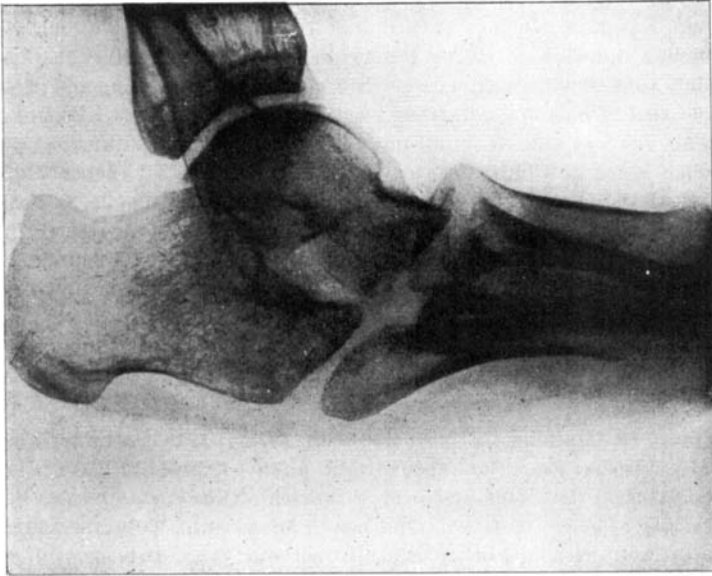


Fig. 11.

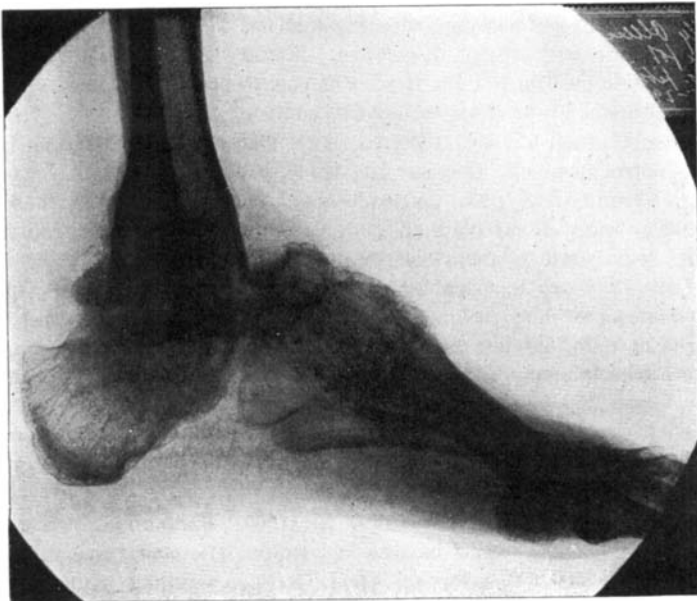


Fig. 12.

tarsal resection. 30 days in hospital. December 11: Up; discharged, on crutches. January 15, 1926: Plaster cast and a cane. May 25: Leather splint. June 26: Discontinue cane. November 26: Foot strong and efficient; same size of boot for both feet. June 16, 1927: Foot very efficient; last-spring, she was able to ski all day long (in Nordmarken). Marked plantar flexion. Good sensibility below the scar. X-ray plate 11, October 29, 1926. (Demonstrated in Oslo Surgical Society December 12, 1927). Autumn 1929: Condition excellent.

Case 9. Lilly O., born 1910. July 20, 1926: Pains in right ankle, since 1925. Fungous swelling. Focus in os navicul. and destructive involvement of talocrural and talo-calcaneo-navicular joints. *Astragalectomy*. 2½ months in hospital. After-treatment only a boot with good heel support; Soon full use of foot. (Dr. Nannestad). In 1929: Foot in excellent condition. X-ray plate 12.

Case 10. Mathias S., born 1904. In spring 1925, pleurisy. July 26, 1926: Abscess formation about right ankle. August 12, 1926: Fistula over external malleolus and over os navicul. *Mediotarsal resection*, with *curetting of focus in fibula*. One month in hospital. December 22, 1926: Walks well with a leather capsule, without cane. December 27: Foot efficient, pt. capable of work. X-ray plate 13. (Demonstrated in Oslo Surgical Society December 12, 1927).

Case 11. Anna S., born 1885. Stayed in the Coast Hospital at Fredriksvern 1901—1902 for tuberculosis of right foot, treated with numerous injections of iodoform and with plaster cast for 15 months. No bandage afterwards; only slight discomfort. January 13, 1920: Right foot in rectangular position; slight flexion and extension. X-ray plate 14. Arthritis deformans; talus flat, os navicul. sunken.

Case 12. Olga T., born 1890. In 1897: Tuberculosis of left foot, wherefore astragalectomy. October 16, 1916: Foot in rectangular position; slight mobility; no pain, no tenderness. Pt. is very active, in spite of marked obesity. X-ray plate 15. (She had also been suffering from coxitis, which was cured by ankylosis in good position).

Case 13. Clary S., born 1895. Treated in Fredriksvern 1908—1909 for tuberculosis of left foot with injection, bandages and crutches. Afterwards no pain, but left foot did not get as strong as right foot. In 1919, severe muscle atrophy. X-ray exam.: Tuberculosis of talus. *Partial astragalectomy*. 3½ month in hospital. June 8, 1929: Both feet equally efficient; she walks a great deal without any trouble. Muscles in good shape. Foot in rectangular position; Plantar flexibility 15°. X-ray plates 16 and 17.

Case 14. Michal M., born 1894. In 1909: *Mediotarsal resection* for tuberculosis of the foot. 3 months in hospital. (Demonstrated in the Oslo Surgical Society December 12, 1927). Pt. is agent and walks about all day long. Foot is strong and efficient. June 10, 1929: Foot efficient. X-ray plate 18.

Case 15. Hans E. K., born 1898. In 1910, treated in Fredriksvern for tuberculosis of right foot. Final treatment, *astragalectomy*. February 2, 1918: Ankylosis of talocrural joint. Walks well, no impairment of gait. X-ray plate 19.

Case 16. Harald S., born 1893. In 1900, pt. came to Fredriksvern suffering from advanced tuberculosis of both feet with fistula formation. Physicians in Oslo had advised amputation of both feet. *Resection of both feet*, removing talus and lower 8 cm. (and 5 cm.) of tibia and fibula. After-exam. in 1927: since 15 years old, he has supported himself, first by cutting wood, later as a carrier's boy, tradesman, chauffeur, etc. In all these years, he has been using ordinary, ready-made boots, without any stays or other support. His feet, although not as strong as normal, are very efficient, and far better than could have been expected from the X-ray plates 20, 21 and 22.



Fig. 13.

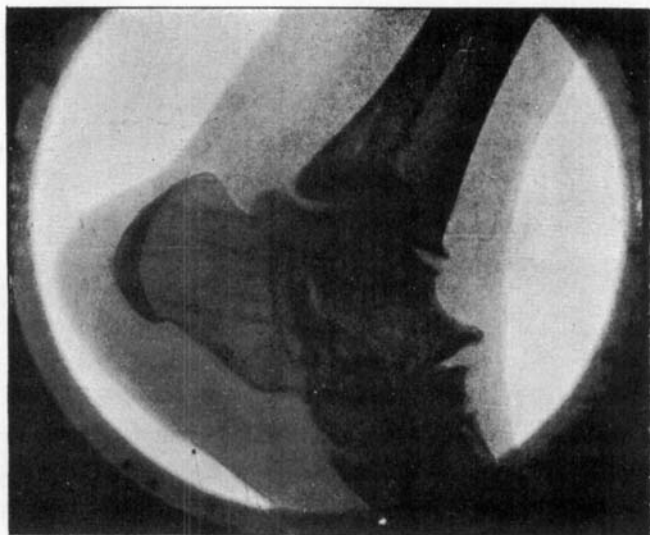


Fig. 14.



Fig. 15.

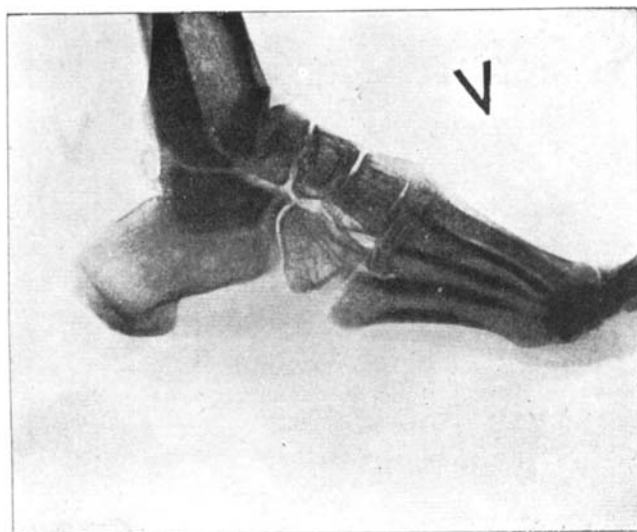


Fig. 16.

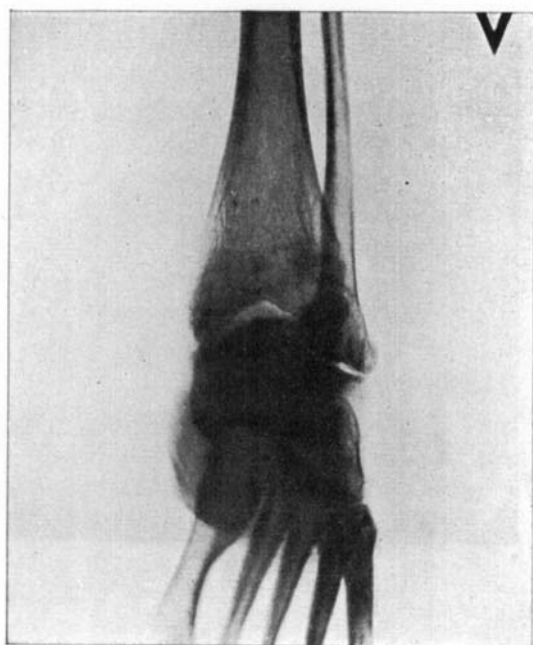


Fig. 17.

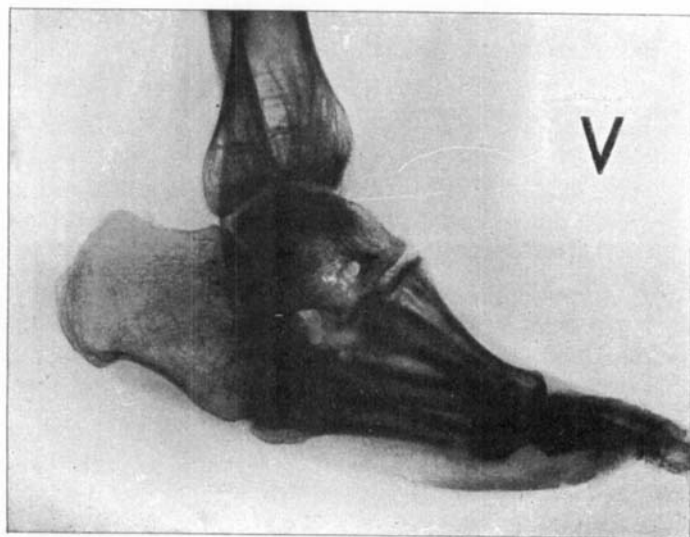


Fig. 18.



Fig. 19.

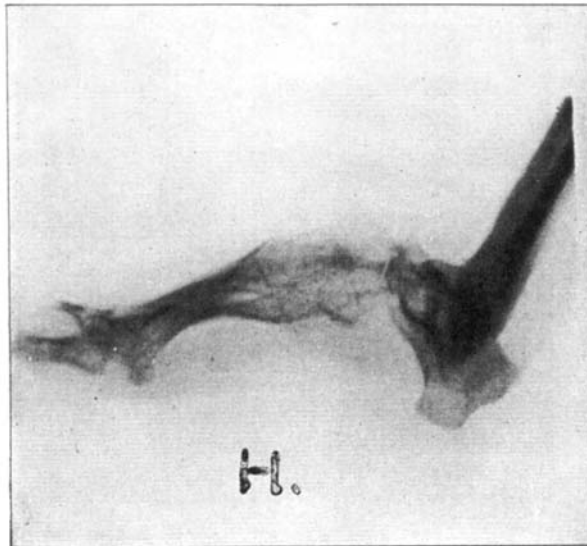


Fig. 20.

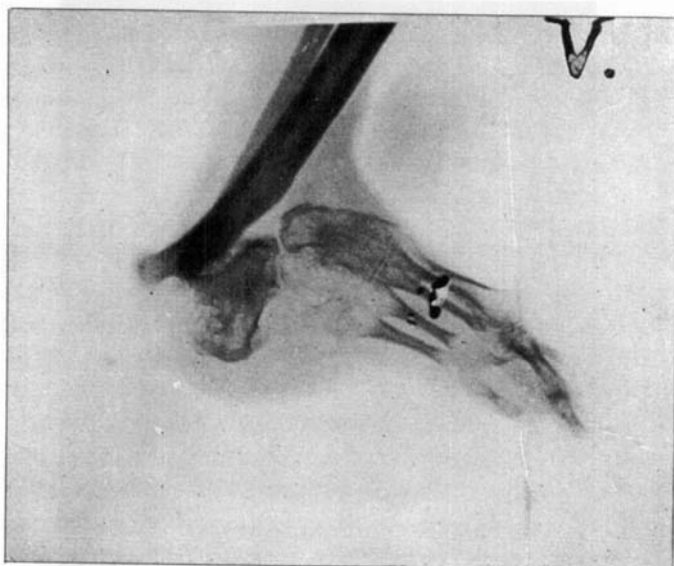


Fig. 21.

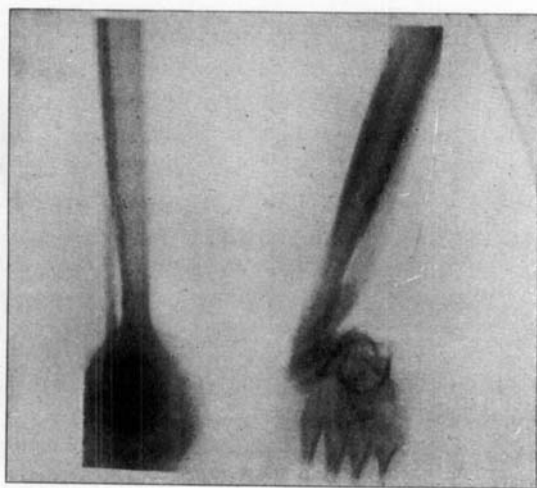


Fig. 22.