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PROGNOSIS OF PES CALCaneo-VALGUS CONGENITUS

HILDING WETZENSTEIN

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Pes calcaneo-valgus congenitus is a common phenomenon among newborn children (Erlacher 1943, Gocht 1929, Mau 1939, Timmer 1924, Wetzenstein 1960 a, b). The clinical features consist of abnormal mobility in pronation while the heel is in valgus position, and increased dorsiflexion of the ankle joint (hyperextensibility). The foot can be extended without resistance until it impinges against the anterior part of the lower leg or it can lie in a spontaneous upward position while the foot is pronated (Figure 1). The foot in itself is usually well formed and can normally be corrected to the neutral position without difficulty. The extent of the plantar flexion can be reduced in some cases. It is rare to find a noticeable abduction deformity. X-rays show nothing distinct pathologically in the relationship between tibia and the talus and the os calcis. Usually both feet are involved. The degree of the valgus position is not necessarily identical for both feet.

Reports give frequencies of between 30-50 per cent of pes calcaneo-valgus congenitus. The great difference between these percentages is possibly due to variations in the diagnostic norms used by different authors.

My own investigation is based on a material collected from all newborn children in the Jönköping Central Hospital's Maternity Department during the period 1956-58. It shows that pes calcaneo-valgus congenitus occurred to a considerable extent (20° or more valgus position of the heel) in 15 per cent, and to a moderate extent (10°-15° valgus) in 12 per cent (Figure 2). The author has selected the valgus position of the heel as criterion for the degree of severity of pes calcaneo-valgus congenitus (Wetzenstein 1960 a, b). No noticeable difference of frequencies occurs between the sexes.

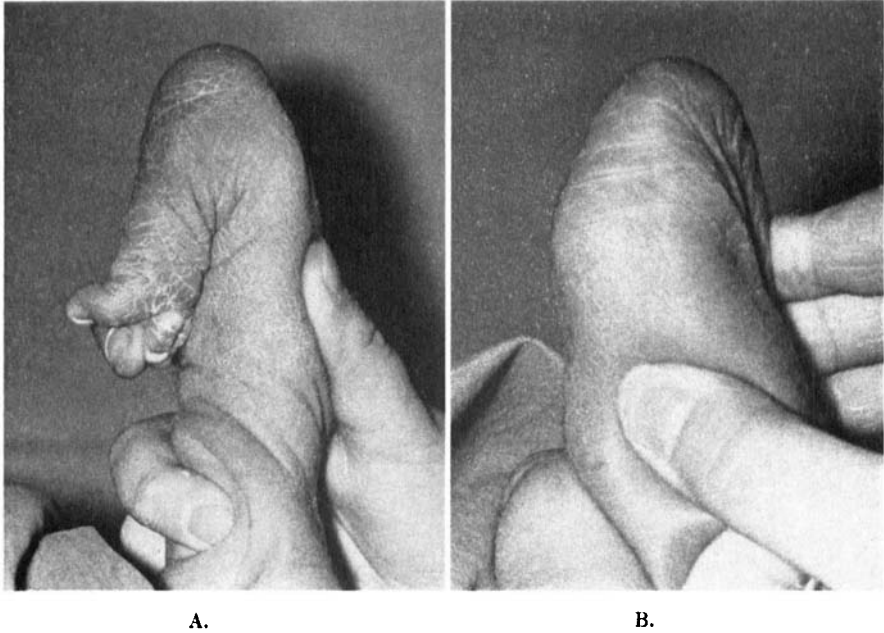


Figure 1. Congenital calcaneo-valgus. A. The foot can be extended without resistance until it impinges against the front of the lower leg while the heel is in a valgus position (B).

The aim of this investigation is to show to which extent pes calcaneo-valgus congenitus later develops into pes plano-valgus, and whether pes calcaneo-valgus congenitus is the early stage of the severe pes plano-valgus in later childhood.

The criteria used in the assessment of the degree of pes plano-valgus and the results obtained from examination of children of 1-2 years, samples from Groups 1, 2, 3, and 4, are based on the earlier report (Wetzenstein 1960 a, b).

The following criteria have been used:

Marked Degree of Pes Plano-Valgus

A. Valgus of some degree and complete flattening of the long arch on standing.

B. Valgus of 10° or more on standing and some degree of depression of the longitudinal arch.

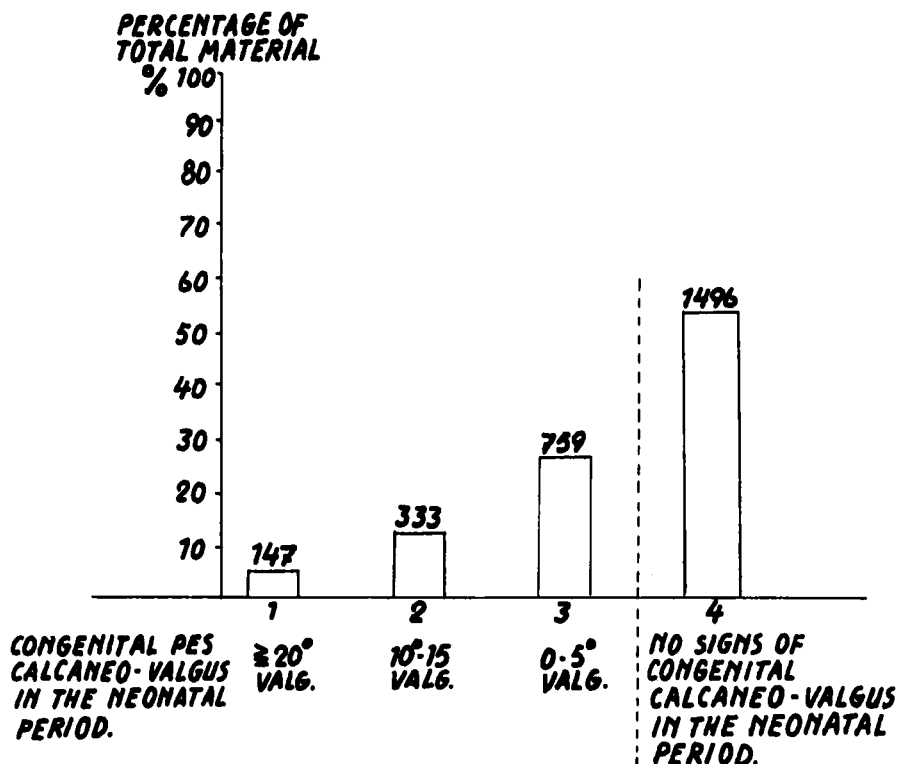


Figure 2. The incidence of congenital calcaneo-valgus in the neonatal period.

Moderate Degree of Pes Plano-Valgus

Up to 5° valgus on standing and moderate depression of the longitudinal arch.

Visual estimation of the degree of valgus is made while the child is standing and walking.

I found a greater frequency (42 per cent) of severe pes plano-valgus in Group 1, which at birth had shown significant signs of pes calcaneo-valgus congenitus, compared with Group 4, the control group, with only 9 per cent incidence at the check-up at the age of one year (Figure 3).

The difference at the follow-up at the two years of age was considerably less, i.e. 43 per cent compared with 23 per cent (Figure 4).

Insufficient information concerning these examinations makes the results uncertain. Only part of the material could be re-examined. It may possibly be assumed that most of those children who did not

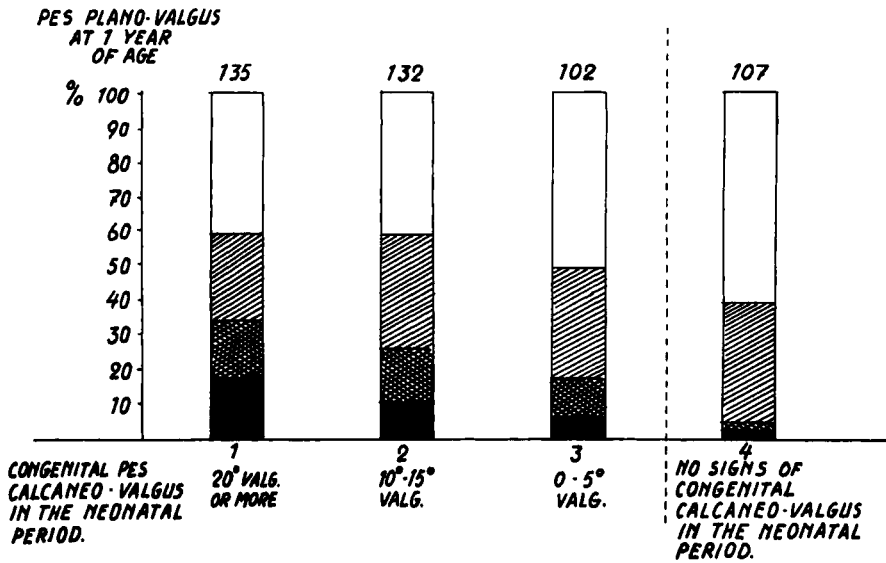


Figure 3. The incidence of pes plano-valgus in congenital calcaneo-valgus at 1 year of age.

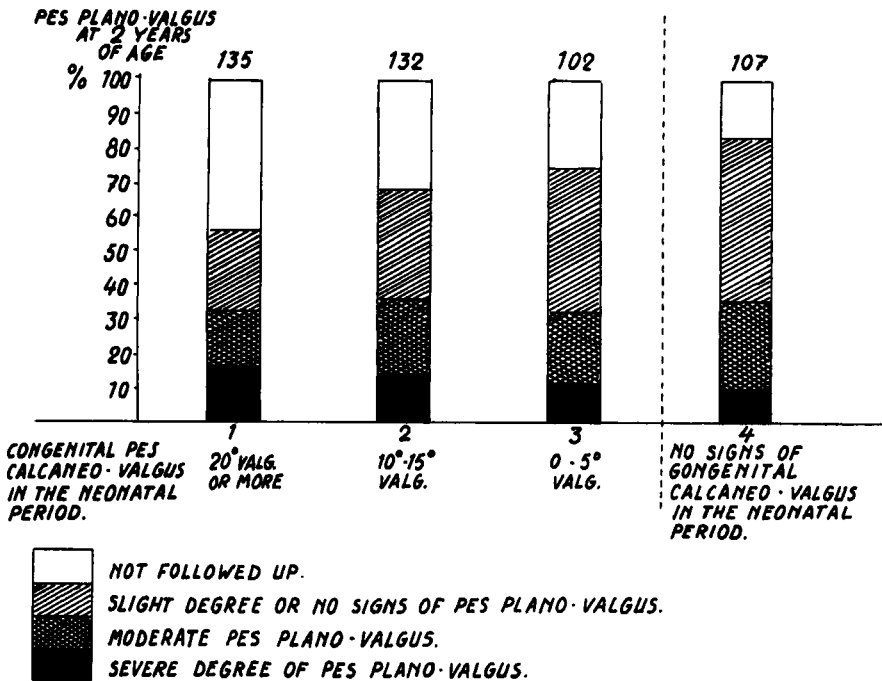


Figure 4. The incidence of pes plano-valgus in congenital calcaneo-valgus at 2 years of age.

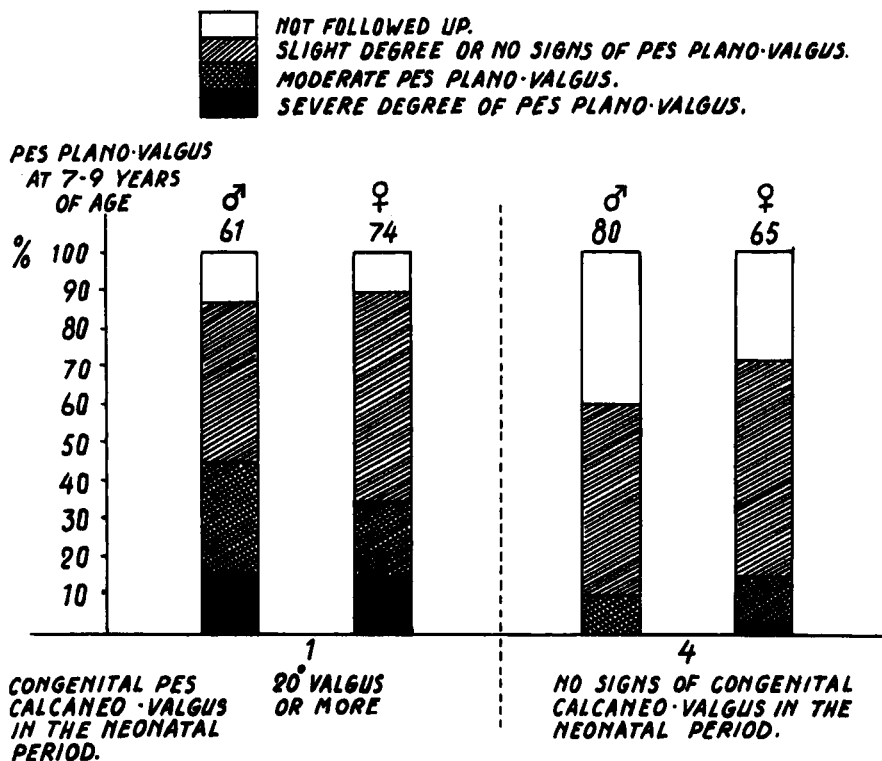


Figure 5. The incidence of pes plano-valgus in congenital calcaneo-valgus at 7-9 years of age.

appear for further control gave no signs of having flat feet, that being the reason for their absence. Neither did the continued examinations during the following few years give greater accuracy to the investigation (Wetzenstein 1962).

When the children were between 7 and 9 years of age they were asked to present themselves for re-examination. This applied to all patients in Group 1 (severe pes calcaneo-valgus congenitus). For the sake of comparison, a control group consisting of 145 children was selected at random from that part of the material which showed no signs of pes calcaneo-valgus congenitus (Group 4). It was considered probable that the difference would be the most marked between these two groups.

According to Figure 5, not all the children summoned for examination presented themselves and non-appearance was greater in the control group.

In a letter sent to the parents, information was given concerning the aim of the investigation and the status of the child at birth in regard to pes calcaneo-valgus congenitus. Apparently parents with children with normal feet at birth showed less interest in the re-examination than did parents with children belonging to Group 1 at birth.

I tried to make this re-examination more complete by obtaining information from the school doctors concerned with all the children in Group 1 and Group 4 (the control group) but these reports were also incomplete and did not compensate for the missing material.

In Figure 5 a marked difference is shown: 15.6 per cent in Group 1 and 1.4 per cent in the control group presented noticeable severe pes plano-valgus. Reservations must be made because of the absence of a sufficiently large control group. On the other hand, it is hardly probable that among the children in the control group who missed the re-examination there was a noteworthy percentage of cases with severe pes plano-valgus.

DISCUSSION

As can be seen from this report, children with severe pes calcaneo-valgus congenitus have a noticeably greater tendency to develop pes plano-valgus than those who show no signs of pes calcaneo-valgus congenitus at birth. It should also be observed that the majority of cases of severe pes calcaneo-valgus congenitus were normalized during the first year, before the child began to walk. Against this background one may ask whether there is any need to treat cases of severe pes calcaneo-valgus congenitus during early infancy. It is, moreover, doubtful if any treatment, e.g. fixation in corrected position, is really effective. Comparative investigations concerning the effect of such treatment do not seem to have been published. In this series different methods of treatment have not been employed with sufficient frequency to clarify the therapeutic effect.

SUMMARY

It seems that pes calcaneo-valgus congenitus is a constitutional anomaly with abnormal mobility in the ankle and subastragalar joint due to lack of stability in the ligaments and impaired muscle tonus, without visible abnormalities in the bone structure. The increased dorsiflexion and pronation mobility with valgus position of the calcaneus is

typical. In some cases there is a fixed malposition but this is generally easily corrected.

Of the children showing a severe degree of pes calcaneo-valgus congenitus at birth 15.6 per cent showed later severe pes plano-valgus between 7-9 years of age. A control group without signs of pes calcaneo-valgus congenitus at birth chosen at random showed a frequency of only 1.4 per cent. In spite of lack of a sufficiently significant material this indicates a distinct difference. Pes calcaneo-valgus congenitus thus gives rise to an increased risk for pes plano-valgus. Most cases, however, become normal spontaneously during the first year of life. This report permits no conclusion about the effect of treatment during the first year on the final results. In my opinion early treatment with fixation in corrected position should be tried more systematically in order to clarify this point. Children with pes calcaneo-valgus who at the age of 1 year show a marked pes plano-valgus should be treated with some form of support against pronation, as spontaneous improvement cannot be counted upon.

At the examination of newborn children, attention should be drawn also to the possibility of pes calcaneo-valgus congenitus and as early examination by an orthopaedic surgeon is recommended.

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