

ON DENIS BROWNE'S TREATMENT OF CLUB-FOOT

BY

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Since *Denis Browne* in the '30's advocated his treatment of congenital clubfoot his method has been most popular in Great Britain, though it does not seem to be used much on the European continent.

Verbrugge introduced the method into Belgium in November '46 and in June '47. *Marique & Steenbruggen* reported that they found the method superior to any other, although no Belgian results have been published.

Leveuf & Bertrand have this year written that the method is very little known in France but is very interesting.

The method was introduced into U.S.A. by *Thompson* in 1942. He modified the splint and avoided manipulations. He claims excellent results in all but one of 60 cases. American orthopaedists have mainly used modified forms of the treatment. In 1943 *Jergeson* had treated 52 cases with good results. In 1944 *Bell & Grice* published 46 cases, 11 excellent, 29 good, and 6 fair, and in 1946 *Blumenfeld, Kaplan & Hicks* gave a detailed report of 41 cases. Of these $\frac{1}{2}$ had excellent results, $\frac{1}{4}$ had a slight adduction deformity but were otherwise good, while the rest had other minor incomplete corrections.

Unfortunately *Denis Browne* has not published his follow-up results but he claims to be able to correct any simple club-foot and to restore at the same time the muscle function, if treatment is begun early enough. He has abandoned tenotomies.

Since December '46 I have personally treated and followed all new cases of early congenital club-foot, following *Denis Browne's* method and using copies of his splints.

It is well known that the different components of a club-foot are intimately related. The supination, the adduction and the cavus components are due to sub-taloid changes, mainly subluxation in the talo-calcaneo-naviculare joint displacing

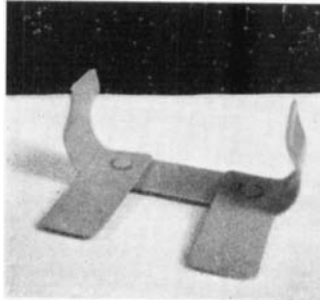


Photo 1.

the sub-taloid part of the foot medial to the talus, while the equinus component occurs at the ankle joint. As *Brockman* has clearly emphasised correction of one component affects all the others and all must be corrected before the club-foot is cured.

Denis Browne prefers to correct the deformities as early as possible without anaesthesia, preferably at one session, and concentrating mainly on the adduction deformity. The foot is then fixed to the splint (see photo 1) with adhesive plaster, and with a piece of felt under the outer side of the forefoot. The other foot is fixed to another splint, without any felt if it is normal. The two splints are joined together by a cross bar, the deformed foot being strongly rotated outwards, a normal foot slightly. When the feet are fixed in this way the child corrects actively the foot's position by kicking and the muscles are exercised. Later, usually when the child is about 6 months old, the flexible and corrected foot is fitted with a

night splint (see photo 2) to maintain the correction. The splint may be used for many months.

This plan has been followed and all patients are now treated as out-patients.

Treatment was begun in 35 cases, but discontinued in 5 cases for reasons not concerning the D.B. method.

30 cases, 21 boys and 9 girls, are still under treatment:



Photo 2.

45 feet, 8 right, 7 left, 15 bilateral. Most patients were brought for treatment within the first 2-3 weeks, a few between the 7th and 10th weeks. All degrees of severity were represented.

After 18 months experience we have studied the preliminary results. All feet have been examined by the author both clinically and radiographically. A good clinical result is claimed when the foot is flexible, easily brought into pronation, abduction and 30-60 degrees dorsiflexion and there is active overcorrection. Radiographically the foot is considered good when the radiograph is normal in the dorsoplantar projection.

The preliminary results were as follows:

Clinically good results: 40 feet, normal radiographs in 33, unsatisfactory radiographs in 7

(in 5 of these 7 the radiographs showed slight adduction of the fore foot, in the remaining two the angle between the axes of the talus and calcaneus was not quite wide enough).

Clinically unsatisfactory results in 5 feet, normal radiographs in 2, unsatisfactory radiographs in 3.

(Of the 2 patients with normal radiographs one had had a severe icterus neonatorum with a haemorrhagic tendency and radiographic signs of subperiosteal haemorrhage of both femurs and tibiae. The right foot was well corrected but active dorsiflexion was not yet satisfactory, although still improving. The other had a dorsiflexion of only 65 degrees.

The 3 with unsatisfactory clinical and radiographic results were: one, a debilitated child, has a passively easily overcorrected foot, but holds the fore-foot in slight adduction; one, whose mother discontinued the treatment for 4 months at a time when the foot was fully corrected, has a dorsiflexion of 80 degrees and radiographically slight adduction and slightly reduced angle between the axes of talus and calcaneus; and one with a troublesome foot complicated by syndactylies of the toes, obviously not a simple club-foot: it is still not quite flexible, dorsiflexion is only 70 degrees, radiographs show some adduction and too narrow an angle between the talus and calcaneus.)

The latest radiographs of each case were shown.

Again I wish to underline that these are of course only preliminary results, but they have impressed all of us who have followed the cases. We believe that *Denis Browne's* treatment seems to be superior to other methods which have been used in this hospital. The final results can naturally not be seen for the first 4-5 years, but one thing may be stressed: so far it has not been necessary to do a single elongation of the Achilles tendon though in earlier treatment this was a very frequent procedure.

SUMMARY

After a brief review of the published results of Denis Browne's method of treating clubfoot, the preliminary results of 18 months' experience with this method are presented. 30

children have been treated: 21 boys and 9 girls, comprising 45 feet: 8 right, 7 left and 15 bilateral. In most cases the treatment was begun within the first 2 to 3 weeks of life, a few between the 7th and 10th weeks. All degrees of severity were included. The feet have been followed both clinically and radiographically. 40 feet are good clinically, of these the radiographs are normal in 33 and nearly normal in 7. 5 feet are not wholly satisfactory clinically, and of these the radiographs are normal in 2 and not satisfactory in 3. The treatment seems to be better than other methods used in this hospital. It is especially notable that it has not been necessary to lengthen the Achilles tendon in any case. The final results will be interesting.

RESUME

Après un court aperçu des résultats de Denis Browne publiés jusqu'ici sur le traitement du pied bot, exposé des résultats primaires provisoires observés après 18 mois d'expérience. Le traitement a été pratiqué d'après la méthode de Denis Browne chez 30 enfants: 21 garçons et 9 fillettes, sur 45 pieds en tout. Dans 8 cas, il s'agissait du pied droit, dans 7 du pied gauche et dans 15 le pied bot était bilatéral. Pour la plupart des enfants le traitement a été instauré dans les 2-3ème semaines, chez quelques-uns dans les 7-10ème semaines après la naissance. Ces cas comportaient tous les degrés de gravité. Les pieds ont été suivis ensuite cliniquement et radiologiquement: 40 pieds étaient bons au point de vue clinique, avec des trouvailles radiographiques normales dans 33 cas et pas tout à fait normales dans 7. Pas absolument satisfaisants au point de vue clinique: 5 pieds dont 2 avec radiographies normales et 3 pas entièrement satisfaisantes. Ce traitement semble meilleur que les autres méthodes employées par cet hôpital. Il est frappant de constater entre autres qu'il n'a pas été nécessaire d'allonger le tendon d'Achille dans un seul cas. Il sera intéressant de voir quels seront les résultats finaux obtenus.

ZUSAMMENFASSUNG

Nach einer kurzen Uebersicht über die bisher veröffentlichten Ergebnisse der Denis Browne'schen Klumpfußbehandlung werden die vorläufigen primären Ergebnisse nach 18-monatiger Erfahrung besprochen. Die Behandlung wurde ad modum Denis Browne an 30 Kindern durchgeführt: 21 Knaben und 9 Mädchen, insgesamt an 45 Füßen, bei 8 rechtsseitigen, 7 linksseitigen und 15 doppelseitigen Fällen. Bei den meisten Kindern wurde die Behandlung in den ersten 2-3 Wochen begonnen, bei einigen wenigen im Alter von 7-10 Wochen. Alle Schweregrade kamen vor. Die Füße wurden klinisch und röntgenologisch nachkontrolliert: Klinisch gut waren 40 Füße mit normalem Röntgenbefund in 33 Fällen und nicht ganz normalem in 7. Klinisch nicht ganz befriedigend waren: 5 Füße, davon 2 mit normalen und 3 mit nicht ganz befriedigenden Röntgenbildern. Die Behandlung scheint besser zu sein als andere in diesem Krankenhaus angewandte Methoden. Besonders auffällig ist, dass es nicht in einem einzigen Falle nötig war, eine Achillessehnenverlängerung vorzunehmen. Man muss mit Interesse die Endergebnisse abwarten.

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DISCUSSION

Nilsonne, Kiær, Thomasen, Silfverskiöld.

H. Stören (Stavern): So far as I have understood from the paper which has just been read, Denis Browne demanded for a good result of the treatment of clubfoot that the atrophy of the leg should not exceed 1 cm. This is to demand something which lies beyond the control of the treatment.

I have for 8 or 10 years been treating club-foot by redressement and plaster bandaging, as soon as possible after birth. Often I have had cases only 1 or 2 days old, and in many of these the muscles of the leg were already markedly atrophic: this was particularly noticeable in cases of unilateral club-foot. Probably in these children the embryonic muscular anlage itself has been imperfect, and no treatment will be likely to cure this.

Denis Browne also stipulated that there should be complete correction at the first session. This is not always feasible even with children 1 or 2 days old. As early as this I have often met with very severe contracture, and complete correction at the first attempt was not possible. Resistance to treatment and a tendency to relapse in these cases cannot be unreservedly attributed to the method by which they have been treated. They were unfavourable cases in the embryonic stage, owing, in my opinion, to defective innervation; this is, of course practically impossible to prove directly.

Further, it is rather too much to say that Denis Browne's treatment of clubfoot is the ideal method. I do not think that this can be said of any method of treatment for a disorder which presents as many variations as does clubfoot. Here, as in so many other conditions, one must treat the cases individually, according to their nature and to the course which they take. Personally, as I have said before, I have for many years used redressement and plaster as soon as I could get the child for treatment. And when Thomasen in 1942 submitted his method of redressement I adopted it with some minor modifications. I have, however, used plaster and not

plain bandages to keep the foot in position. The results of clubfoot treatment ought not to be submitted until after 8 or 10 years. Not until then can we get some idea of the final result, and in many cases not even then.

Poul Guildal (Copenhagen): Denis Browne's method no doubt has certain advantages over some methods of treating congenital clubfoot. That good results are obtained when the patients are brought for treatment in their first weeks does not say so very much, since one can nearly always get quite good results whatever treatment one uses. It is difficult to judge from so short an observation period what the results will be in cases which are brought for treatment later. With nearly all methods of treatment the primary results are good, but relapses do not appear until later, and there is no doubt that in certain cases these relapses can be very resistant and require treatment of both the soft and bony parts for many years.

It is difficult to understand how the muscles can be better preserved with Denis Browne's method than with the usual plaster treatment, since the legs are if anything more firmly fixed than when they are free from each other. It is also difficult to believe that correction of the different components of a club-foot should be better with this method which uses a stiff firm plate than with a plaster bandage which can be adapted to the individual components. But one cannot judge whether the method represents a real advance before one sees the late results. There is no doubt that it is technically just as difficult as the usual manipulations and plasterings.

Agerholm-Christensen: I am afraid Dr. *Stören* has misunderstood me. *Denis Browne* claims only to be able to correct any *simple* club-foot. He too knows the most resistant cases as we see them in arthrogryphosis. He prefers to correct the foot in one session—if possible. I did not call it the ideal method, but I believe it is the best method which has been used in this hospital. I disagree with Dr. *Guildal*: it is much

easier to apply the *Denis Browne* splint than a plaster of Paris bandage to a baby foot. I think that the fixation of both feet together gives the child much more kicking exercise than plaster. Dr. *Thomasen* refers to his paper "Der angeborene Klumpfuss" (*Acta Orthop. Scand.* XII. 33. 1941). I can only say that the importance of correcting the inversion of the calcaneus has been stressed for many years (e.g. *Bankart, Elmslie, MacMurray, Platt* in 1920), and that the dorso-plantar radiographic projection has long been used (before *Wisbrun*). The first radiograph I showed to day was a reproduction from *Brockmann's* book published in 1930. *Thomasen* recommended in 1941 manipulations and fixation with flannel bandages. He had treated 7 cases which had been followed up to an average age of 13 months; in 3 an elongation of the Achilles tendon was done. I have been through the notes of 60 club feet treated by this technic in the Orthopaedic Hospital, Cph. since 1943/44. By 1947/48 44 had had an elongation of the Achilles tendon usually in the first year, 45 showed adductus and 17 varus positions. I believe the future will show that with *Denis Browne's* treatment elongation will rarely be necessary, and that the varus position will be corrected; but we may have trouble with the adductus position. The treatment does correct this position, but I am afraid that some children will not have sufficient muscle power to maintain the correction.