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CONGENITAL CLUBFOOT

A Follow-up of 95 Persons Treated in Sweden from 1940–1945 with Special Reference to their Social Adaption and Subjective Symptoms from the Foot

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"In assessing after-results in congenital clubfoot one must remember that the patient is the final judge of whether he has a good foot, and there is quite a difference between theory and practice.

Occasionally one meets a patient whose foot by our standards is a thoroughly bad result and yet he is quite satisfied with it. But isolated cases are no justification for allowing such deformities to occur or for failing to give the patient the best possible foot.

Putting oneself into the patient's place, what would we want? We should want to be free from pain, to wear ordinary shoes, we should want to be able to play games or to dance, to earn a living or to look after a house and bring up a family" (Fripp 1951).

MATERIAL AND METHODS

Between the 1st January, 1940 and the 31st December, 1944, 27,146 patients consulted the then existing institutions for the disabled in Göteborg and Helsingborg. The journals have been gone through in order to see which persons were diagnosed as having congenital clubfeet during the above-mentioned period. Persons who in addition to congenital clubfoot suffered from arthrogryposis, cerebral palsy, or spina bifida were not included in the investigation as it was desired only to study those persons who could be considered physically fit except for their clubfoot/feet. Persons born from 1939 to 1944 have been included. Of those born in 1939 only those have been included who started treatment after the 1st January, 1940.

106 persons with congenital clubfeet were found; 82 men (77.4 per cent) and 24 women (22.6 per cent), 59 unilateral (55.7 per cent) and 47 bilateral (44.3 per cent). Ten individuals had died since the beginning of the treatment. One person could not be traced.

A questionnaire was sent to the remaining 95 persons. The questions comprised

their subjective judgment of the feet and related social data. All questions were answered by all participants.

At the follow-up, which was performed in the patients' homes, a clinical investigation of their feet was made. Ninety-five persons were followed up, 93 of them by letter and by personal visit by the author in their homes. Two men were followed up by letter and by telephone. Both refused to allow a personal visit. They mentioned no pains of a subjective nature. The follow-up thus comprised 99 per cent of the still living from the initial investigative material. (In certain cases, where an objective estimation of the feet was necessary for the final conclusion, the follow-up included 93 persons.) Of the 95 persons in the investigation, 74 were men and 21 women. In 51 cases, the deformity was unilateral and in 44 bilateral. The average age at follow-up was 30 years; the youngest person was 27 years of age and the oldest 33 years of age.

RESULTS

A *heriditary history* could be established in 12 of the 95 patients (12.6 per cent).

Associated abnormalities could be found in five boys (5/95).

The average age at the time of first treatment was 4.2 months, 4.5 for unilateral, and 3.7 months for bilateral.

Treatment

Of 95 persons (139 feet) 82 were operated (121 feet); 42 had unilateral foot deformities and 40 bilateral. Fourteen persons (18 feet) were only treated through manipulative correction and plaster. (One person with a bilateral foot deformity was treated operatively on one foot and conservatively on the other.) On the 121 operated feet, 213 soft tissue operations and 104 skeletal operations were performed.

Hospitalization and clinical check-ups

Of the 95 persons, 87 had been treated during their stay in hospital and as out-patients. The average number of days of hospitalization per person was 77. Those treated conservatively had an average hospital stay of 7 days. In eight cases, treatment could be performed by clinical check-ups only. The average number of out-patient check-ups was 16. The average age at the latest clinical check-up was 12 years.

Gymnastics at school

During their school years 27 persons were totally or partly exempted from gymnastics; 19 boys (24.3 per cent) and 8 girls (38.1 per cent). There was no statistically significant difference between the sexes in

regard to exemption from gymnastics. Of the 27 persons who were exempted from gymnastics 9 (17.6 per cent) had unilateral foot deformities and 18 (40.9 per cent) bilateral. Persons with bilateral club feet were exempted from gymnastics more frequently than those with unilateral club feet.

Active athletics

This aspect was investigated among 94 patients. Of 50 persons with unilateral club foot (37 men and 13 women), 18 men, but no women had participated in competitive sports (non-competitive sports were not included). Of 44 persons with bilateral club feet (36 men and 8 women), 10 men and one woman had actively competed in sports. Half of the men with unilateral foot deformities had taken part in competitive sports, while only 25 per cent of those with bilateral foot deformities had done so. Ball games were the dominant type of athletics.

Military service

Eight persons were exempted from or had reduced conscription for reasons other than their feet.

In the remaining 66 men full conscription was completed by 85 per cent of persons with unilateral foot deformities and by 57.5 per cent of those with bilateral club feet. Limited service or full exemption occurred in 15 per cent of those with unilateral foot deformities and in 42.5 per cent of those with bilateral deformities.

Cosmetic problems

At the follow-up, the patients and their relatives were questioned about cosmetic problems during childhood as well as those problems which remained at the time of the follow-up. In 94 cases, these problems could be elucidated. Thirty-three persons stated that they had suffered from cosmetic problems during their childhood (31.5 per cent of the men and 47.6 per cent of the women). Of those 33 persons, 14 stated that the problems remained at the time of the follow-up; 7 men (9.6 per cent) and 7 women (33.3 per cent). During childhood there was no significant difference between the cosmetic problems encountered by men and women. As regards their remaining cosmetic problems a statistically significant difference was noted at the 95 per cent level, at which the women more often voiced problems than the men.

Civil status

No statistical difference existed in the distribution of civil status among males and females when compared with the total population of corresponding age.

None of the 21 women was divorced. Two of the 74 men were divorced (2.7 per cent). This corresponded to the national average for the same age (3 per cent).

Occupation

All 95 persons had completed vocational training. The occupation was mainly sedentary for 27, sedentary and walking for 58, standing and walking for 7 and composed of manual labour for 3.

They were asked whether their feet had influenced their choice of occupation. Eighty-eight of the 95 persons had been able to manage their initially chosen occupation without difficulty. In the case of four persons, all of whom had subjective problems with their feet when they chose a vocation, the community was obliged to provide rehabilitation aid. Three of them function today without any problems in their new jobs, while one, carrying out an unplanned job at the time of follow-up, had the same subjective problems as before re-training. The remaining three persons have changed to other occupations on their own initiative and function in their daily working life without any foot problems.

Shoes

Through the case histories, the author has recorded the type of shoes at the time of the last clinical check-up at the orthopaedic clinic, i.e. the doctor's recommendation of shoes and possible changes. Similar notations about shoes have been made at follow-up examinations.

Table 1. Condition of shoes in 95 cases of congenital club foot.

	Last check-up	Follow-up
"Shop" shoes	16	77
"Shop" shoes with insert	33	9
"Shop" shoes with modification of heels or soles	26	5
Orthopaedic shoes	14	4
Not yet walking	4	
No record	2	

On the average, 18 years had elapsed between the previous check-up at the Orthopaedic Clinic and the follow-up examination. During this time, the patients' shoe conditions had changed considerably. Persons who used orthopaedic shoes had decreased from 14 of 89 (15.7 per cent) to 4 of 95 (4.2 per cent), while those who had their shoes altered by an orthopaedic workshop had decreased from 26 out of 89 (30 per cent) to 5 out of 95 (5.2 per cent). An insert had previously been used in "shop" shoes by 33 out of 89 (38 per cent) and at the follow-up was used by 9 out of 95 (9.5 per cent).

At the follow-ups, an abnormal increase in the wear and tear on the lateral side of the sole was observed in 2/3 of the 93 follow-up persons. All follow-up persons indicated that laced shoes were best for their feet.

The difference in the length of the feet could be measured in 49 of the 51 persons with unilateral foot deformities. The foot length was measured from the heel to the point of the big toe and the difference was between 0.5 and 7 cm—an average of 2.1 cm. Four persons showed no difference in the length of their feet. Fourteen of 16 persons with a difference in foot length of 3 cm or more used some sort of filling to compensate for the difference in foot length, e.g. inserts, paper, cotton and soles. (In two cases the persons bought two pair of shoes of unequal size.) In cases of less than 3 cm difference in foot size similar alterations were made by 4 of 29 persons. None of the persons with bilateral club feet had a foot length difference exceeding 3 cm and none used complementary insertions for compensation of their foot length difference.

The difference in the length of the legs was measured with the patient in a standing position without shoes. Roentgenologic measurement of the leg was not possible in this investigation. In cases of pelvic tilt, a compensatory lumbar scoliosis existed which in all cases was soft and could be straightened out with heightening under the shorter leg. Twenty-nine persons with unilateral foot deformities had a leg length difference of between 1 and 3 cm. In three cases of bilateral club feet, a leg length difference of 1, 1.5 and 5 cm existed respectively.

Only three persons compensated for leg length difference. Two persons with unilateral foot deformities used corrective heightening of ½ cm each. The shortening measured was 1½ and 2 cm respectively. One person with a bilateral foot deformity and a leg length difference of 5 cm used corrective heightening insertions of 2½ cm.

Limping: Fifty persons with unilateral club feet were asked if they

considered themselves lame. Thirteen persons answered more or less affirmatively. In two of these, no measurable leg length difference existed. Six persons had a difference of 1–2 cm and five a difference of 2–3 cm. Since two persons without leg length difference indicated subjective limping and only 11 out of 29 with leg length difference of 1–3 cm thought likewise, there is reason to think that subjective limping is an expression of the individual's conception of the functions of leg and foot—independent of differences in leg length. This might also partly explain why none of the persons with subjective limping had done anything to compensate their difference in leg length.

Functional foot symptoms

On follow-up the following introductory questions were asked:

1) "Can you walk on your foot/feet without problems?"

2) "Are your daily activities limited due to pains from your feet?"

Eighty-eight persons mentioned that they had no symptoms, while foot problems occurred in seven (three females and four males), one unilaterally and six bilaterally. This figure corresponds to 7.4 per cent of 95 follow-up persons.

In order to get a closer look at the foot problems which occurred in these seven persons, some further questions were asked (see Table 2).

Table 2. Functional foot symptoms in 7 persons with congenital club feet.

	Number of persons
Pain in foot/feet	5
Tiredness in foot/feet on walking	0
Difficulty in walking on a level surface	2
Difficulty in walking on uneven ground	6
Difficulty in climbing stairs	2

Foot/feet pain occurred in five persons. Four of these had daily pains which were provoked by wobbling movements in the ankle joint. One person had daily pains in the big toe on which a partial phalangeal reaction had been performed.

Tiredness in the foot/feet did not occur in any of the cases.

Difficulty in walking on a level surface was mentioned by two patients. One of them had pain from the ankle joint of one of the sides which was fixed at 20 degrees of equinus. He also had fixed subtalar

joints. The other person had symptoms due to callosity on the big toe. The condition was diagnosed as hallux flexus.

Difficulty in walking on uneven ground was found in six patients. In five of them, the difficulty was caused by a feeling of instability in the ankle joint. In one case, pains occurred after a partial phalangeal resection due to a hallux/rigidus.

Two persons with bilateral foot deformities had difficulty in climbing stairs. Both of them had a fixed equinus deformity on one foot, of 20 and 30 degrees respectively, as well as fixed subtalar joints.

The 88 persons who upon initial questioning mentioned that they did not have any foot problems which limited their daily activities were asked the same questions as were asked to the seven who had problems due to their foot deformity(ies). The result is shown in Table 3.

Table 3. Functional discomfort and/or difficulties in 88 persons who on preliminary questioning did not mention any problems due to congenital foot deformity(ies).

	Number of persons
Pain in the foot/feet	3
Tiredness in foot/feet on walking	12
Difficulty in walking on a level surface	–
Difficulty in walking on uneven ground	7
Difficulty in climbing stairs	3

Foot/feet pain occurred in three persons and all of these had difficulties in walking on uneven ground. The pain occurred in conjunction with wobbling movements in the ankle joint and disappeared after a few seconds.

Foot/feet tiredness was experienced by 12 persons when walking and did not cause any pains. (None of the seven persons with foot pains that limited their daily activities experienced tiredness in their feet. This might be accounted for by the fact that they spared their feet and thus never reached their physical limit.)

Difficulty in walking on a level surface was not evident.

Seven persons had difficulties in walking on uneven ground, due to instability in the ankle joint.

Three persons with bilateral club feet experienced difficulties in climbing stairs. One man had both his feet fixed in an equinus position of 10 degrees and another had one foot fixed in an equinus position of 10 degrees. One person experienced difficulties in climbing stairs in spite of a dorsiflexion of 15 degrees in both of his ankle joints.

DISCUSSION

In Anglo-Saxon and German literature there is a lack of complete information about the subjective attitude towards the foot in persons with club foot/feet. Information about social adaptation is almost completely lacking.

Of the feet followed up in this study 88 per cent (119/135) had an appearance which differed from that of the normal foot. One fifth (19/95) of the persons had some discomfort such as pain, tiredness or instability. They all functioned well at work but seven were so troubled that it hampered their free time activities.

Previous reports regarding the subjective functional results in patients with congenital club feet have mainly been focused on one or few subjective functional aspects (Peter 1952, Fredenhagen 1955, Wynne-Davies 1964, Nemechek 1968, Fjeldborg 1971).

The purpose of this study was to assess the functional capacity of people with club feet approximately 30 years after initiated treatment, and to illustrate their adaptation to society in general with respect to their deformity. With this in mind their period of schooling and also their present stage of maturity has been taken into account.

During the interviews with the persons it was obvious that the dominant problem during their schooling and growing-up period has been the cosmetic problems which have hampered their assimilation with the normal group, e.g. during school gymnastics, games and other sporting activities. In spite of this a large percentage of them participated in active sports and even later in life several have taken part in competitive sports with good results. Awareness of the foot's appearance has been an embarrassment for the majority in the group, but in particular the men have been successful in overcoming this embarrassment and have shown good adaptability, as for example in the case of military conscription with all its implications. Military conscription obligations imply fairly heavy demands on the individuals concerned especially as regards walking and marching; some of the persons were in fact assigned to lighter duties which they were able to fulfil. The study also shows that the majority of the persons could fulfil the requirements of full-time work in spite of considerable discomfort from the feet; work was chosen to suit the individual's handicap, but this does not imply that the individuals did not experience a meaningful role in their environment. It is of interest to note that though some of the patients abstained from sports, they still could undertake and

accomplish a full day's work. The fact that 95 per cent of the patients used ordinary standard "shop" shoes can be looked upon as an expression of relatively minor problems with their feet. With regard to marriage the present study group showed no significant deviation from the normal population in the same age group.

SUMMARY

A follow-up, with special reference to social adaptation and subjective symptoms, was done on 95 persons with congenital club feet treated in Sweden 1940–1945. At an age of 27–33 years the individuals managed themselves well and in spite of physical as well as psychological handicap they deviated relatively only a little from the normal population as regards work, sports and other social adaptibility.

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