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SPONTANEOUS CORRECTION OF SEVERE TIBIOFEMORAL DEFORMITY IN GROWING CHILDREN

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The progress of pronounced varus and valgus deformities of the knees in 20 children were followed. The most pronounced varus deformity was 33 degrees and the most pronounced valgus deformity was 20 degrees. The tibiofemoral angle in growing children was measured on roentgenograms by drawing a longitudinal axis between the femoral and tibial diaphyseal cortices. Spontaneous correction was seen in all cases during the growth period.

Key words: genu valgum; genu varum; growth; knee

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The normal development of the tibiofemoral angle in children follows a certain pattern during growth (Salenius & Vankka 1975). The opinion is still expressed by some authors that pronounced genu varus and genu valgus deformity in growing children should be corrected operatively if it is still present after the age of 10 years (Apley 1977, Sharrard 1979). In some patients the varus or valgus deformities are so great that it is difficult to convince the parents that the child's knees will straighten without surgery. For this reason we have followed 20 patients in whom the varus or valgus deformity was exceptionally large in early childhood.

PATIENTS AND METHODS

The patients were all between the ages of 1 and 4 years at the first examination. Using the method previously reported (Salenius & Vankka 1975), the tibiofemoral angle was measured on roentgenograms taken in the outpatient department at 6- to 12-month intervals. The ages of the patients at the last follow-up examination varied from 4–16 years.

RESULTS

Spontaneous correction of the deformity in all patients occurred without operation. The tibiofemoral angles at the first examination and at the follow-up are shown in Table 1. A pronounced varus angulation varying from 16–33 degrees was present in the majority of the patients up to the age of 2 years, whereas only one patient had a valgus angulation of 15 degrees at this age. After the age of 2 years, most of the patients had changed to a valgus angle of 15–20 degrees. At the follow-up examination 2–13 years later the angle approached normal (Salenius & Vankka 1975). One 13-year-old patient had 12 degrees of valgus angulation, which at the follow-up at the age of 16 years had decreased to 9 degrees (Table 1, Case 18). Figure 1a–c shows a typical spontaneous correction of the varus deformity with growth. A similar result is seen in Figure 2a–c. Spontaneous correction of a pronounced valgus deformity is seen in Figure 3a, b.

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Table 1. The tibiofemoral angle in 20 children at the first examination and at the follow-up

Case	Sex	Age at first exam. in years	Tibiofem. angle in degrees varus	valgus	Age at follow-up in years	Tibiofem. angle in degrees varus	valgus
1	M	1	22		10		7
2	F	1		15	6		6
3	F	1	33		9		7
4	F	1	29		12		8
5	M	1	26		5		0
6	M	1	28		11		6
7	M	1	16		15		5
8	F	1	22		7		10
9	M	2	20		4		7
10	M	2		15	12		7
11	M	2		16	9		6
12	M	2	25		16		6
13	F	2		16	12		7
14	M	2	27		11		8
15	M	3		20	16		7
16	M	3		16	14		9
17	M	3		17	7		10
18	M	3		19	16		9
19	M	4		15	6		5
20	M	4		18	16		8

Figure 1a. A 1-year-old boy with a 33-degree tibiofemoral angle in varus.

Figure 1b. At the age of 9 years the tibiofemoral angle has spontaneously corrected to a valgus angulation of 7 degrees on both sides.

Figure 2a. A 2-year-old boy with a varus angle of 26 degrees on one side and 28 degrees on the other.

Figure 2b. At the age of 11 years a spontaneous correction had changed the angle to 8 degrees valgus on one side and 9 degrees on the other.

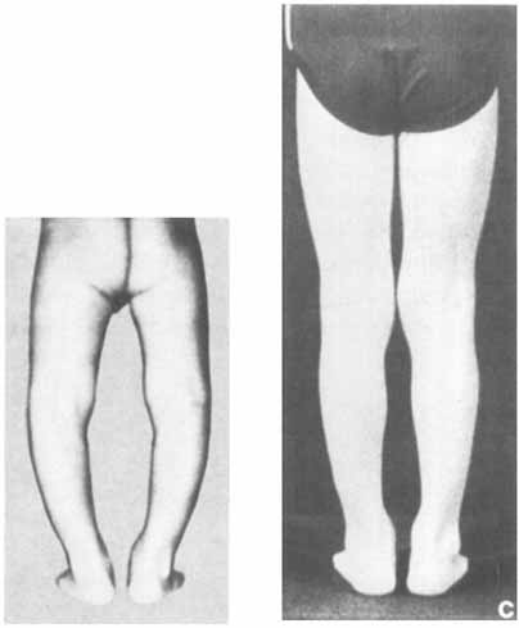

Figure 2c. The appearance of the same patient's legs seen from behind at the ages of 2 years and 11 years, respectively.

DISCUSSION

We have reported that the tibiofemoral angle in children straightens spontaneously in 95 per cent of patients (Salenius & Vankka 1975). It should be noted, however, that before the age of 1 to 2 years a varus deformity is most common and only rarely is a valgus deformity seen. After the age of 2 a valgus deformity is common with a varus deformity occurring only occasionally. When patients are followed regularly, usually at 6-month intervals, the correction trend can be seen. If the deformity has not corrected spontaneously with growth by the age of 10 years, corrective osteotomy may be indicated. The present series includes one patient, however, with a valgus deformity of 12 degrees at the age of 13 years which had corrected spontaneously by the age of 16 years. As we have reported earlier, spontaneous straightening was seen in 95 per cent of patients, but the previous material comprised slighter deformities. The present series shows that also se-

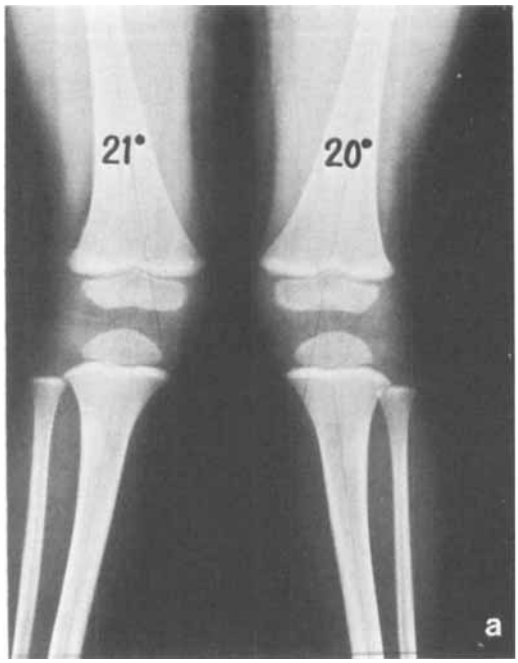

Figure 3a. A 3-year-old boy with a valgus angle of 21 degrees on the right side and 20 degrees on the left.

Figure 3b. At the age of 16 the angle had corrected spontaneously to 7 degrees.

vere tibiofemoral deformities in growing children will be corrected in most cases without operation. Therefore, the indications for a correction operation before the age of 10 to 13 years should be very carefully considered despite a pathological clinical appearance of the knees in early childhood.

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