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ON THE TREATMENT OF TUBERCULOUS SPONDYLITIS IN CHILDREN

20 After-Examined Cases Treated according
to Albee's Method

BY

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When studying the literature one is astonished at the great hopes that have been attached to surgical ankylosis of the vertebrae, especially to the method employed by Albee. It is surprising to see how badly the character of the operation has been understood and what slight interest has been shown to the general orthopaedic care of the patient. The general tendency towards abandoning the operative stabilization of the spinal column, which has made itself felt of late years, is no doubt to a large extent due to the fact that overmuch has been expected from the operation and therefore other parts of the therapeutic plan—at least as important—have been neglected.

From a purely biological point of view, without the support of any examined material of patients, it may be said without doubt that all attempts at surgical fixation of the backbone during the acute stage of spondylitis are undertakings of dubious value owing to the difficulty of judging the condition and to the uncertainty regarding the development and tendency of the tuberculous process.

The opinion put forward by *Albee* in 1933 that the operative method indicated by him is to be regarded not only as «an excellent internal immobilization», but, thanks to its vascularizing effect, also as having a direct curative effect on the tuber-

culous process in the vertebrae, must be characterized as unproven.

H. Waldenström has judged the value of surgical intervention quite differently, introducing the operation as part of a treatment that extends over many years. According to the scheme of treatment adopted by him the patient is first kept in a plaster bed until the tuberculous process can be considered to have entered the healing stage. During this time any gibbosity present is likewise gradually corrected by *v. Finck's* method. Operation is subsequently resorted to as a safeguard against recurrence of the spinal deformity.

Waldenström's material published in 1924 contains 66 cases under 15 years of age, and in 52 of these ideal results were obtained. The author maintains that the lower age-limit for operating on children should be put at 4—5 years. Commonly opinions vary widely as to whether or not use should be made of stabilizing operations in spondylitic children. *Sorrel* appears to be definitely opposed to operations during the juvenile ages, while several other authors, e. g. *Maffei* and *Maucclair*, recommend them. *Langenskiöld* has operated only on adults. His statistics from the year 1923 includes 29 cases. *Sven Johansson* has also treated a large juvenile material (94 cases, published 1924). He operates in an early stage too, and at any rate his primary results appear to be good.

In a work dated 1932 *Freund* studied 40 cases of spondylitis in children. He concluded that the operation ought not to be undertaken on children in the acute stage, though if performed during the healing stage it may »contribute considerably to the stabilization of the defective spine«.

The material to be discussed here—20 cases under 14 years of age, 10 boys and 10 girls—has been treated according to the principles put down in *Waldenström's* work of 1924. The patients were first kept in a plaster bed for periods ranging from 3 months to 4 years. During this time any kyphosis present was corrected to the greatest possible extent by *v. Finck's* method. When the tuberculous process no longer exhibited clinical or roentgenological signs of progression, operation was performed,

and a graft from the tibia was fixed by *Albee's* method in the saw-cleft spinal processes in order to obtain the best possible fixation. After the operation the patients were kept for further 2—3 months in the plaster bed, after which they were furnished with plaster jackets. Most of the cases have later also been provided with leather jackets.

A synoptical review of the material is given in the appended table.

One case succumbed in immediate connection with the operation. It was not possible to account for the sudden lethal issue. At the operation a slight lesion of the dura occurred, but this may scarcely have been of any importance. Autopsy was refused. Another death, from meningitis, occurred about three years after the operation. The patient was then free of symptoms from the spine.

The remaining cases were examined clinically and radiologically from 2 to 14 years after the operation. In the cases in which several vertebrae were diseased it was found that the height of the patient had sometimes been decidedly affected. The condition of the back is indicated in the table. A study of the X-ray pictures shows that the correction of the gibbus takes place to a strikingly high degree by the compensatory curvature of adjacent parts of the spine in a lordotic direction, a phenomenon that has been reported by several authors.

Fractures of the graft occurred in no less than 5 cases. In one case (2/1930) a graft fracture was found as early as four months after the operation. The fracture subsequently healed and the patient was free from symptoms; died two years later of meningitis. Case 3/1923 showed increased gibbosity and fracture of the graft one year after the operation. Attempts to re-correct the spinal deformity met with failure. In order, if possible, to prevent an increase of the gibbosity a fresh pedicular insertion was made four years after the first operation. The final result, however, must be regarded as bad.

In none of the cases has the fracture the graft given rise to clinical symptoms in the form of pains or sensations of fatigue

No.	Treated in plaster bed	Age at Op. yrs	Oper. Course	Exam. after yrs	Good	Med- ium	Bad
1/1924	1 yr 10 mths	7	Normal	11	÷		
2/1926	1 yr	4 $\frac{1}{2}$	Normal	11	÷		
6/1930	5 mths	4	Normal	6	÷		
8/1923	3 yrs	8	Normal	13	÷		
2/1927	2 $\frac{1}{2}$ yrs	7	Normal	8	÷		
11/1927	1 yr 9 mths	6	Normal	8	÷		
2/1924	1 yr	7	Normal	11		÷	
10/1929	1 yr 3 mths	3 $\frac{1}{2}$	Normal	6	÷		
1/1921	1 yr	11	Normal	14	÷		
25/1929	1 yr 2 mths	7	—				
3/1923	2 $\frac{1}{2}$ yrs	9	Normal	12			÷
181/1932	2 yrs	10	Normal	3	÷		
7/1926	3 mths	8	Normal	3	÷		
367/1932	6 mths	10	Normal	3		÷	

Site	Back Status	Comments
D I—IV	Back mobile. Long-arched, relatively slight dorsal kyphosis. No trouble	
L II—III	Lumbar part somewhat stiff. No deformity. No trouble	
D VII—XI	Some lumbar lordosis. No trouble	Fracture of the graft
D VII—VIII	Rather pronounced compensatory cervical kyphosis. Quite healthy and able to work	Fracture of tibia
D VII—LI	Fully normal, freely mobile back. No trouble	Fracture of tibia
D IX—XII	Some stiffness in lumbar part. Scheuerman's kyphosis. No trouble	Fracture of the graft
D IX—XI	Short stature. Roundarched kyphosis with fixed gibbus over D X. No trouble	
L III—IV	Slight compens. dorsal kyphosis. Sometimes tired in back	Fracture of the graft
L II—III	Short stature. Lumbar part somewhat stiff. No trouble	
		Died in immediate connection with the operation
D XII—LII	Markedly kinked gibbus over D II. Back trouble	Fractures of the graft
L II—III	Long-arched dorsal kyphosis. No back trouble. Lumbar part stiff. No trouble	
	Back normal. No subjective symptoms	Died after accident 3 yrs after the operation
L IV—L V	Stiff, somewhat lordotic lumbar part	Lower end of the graft projects a little

No.	Treated in plaster bed	Age at Op. yrs	Oper. Course	Exam. ter afyrs	Good	Med-ium	Bad
2/1930	2 yrs	6	Normal	3	÷		
20/1926	3 mths	14	Normal	10	÷		
1/1925	1 yr	2	Normal	13	÷		
272/1923	2 yrs	11	Normal	13			÷
193/1934	6 mths	6½	Normal	12	÷		
4/1925	4 yrs	13	Normal	2	÷		

in the back. Such symptoms are described by *Odelberg-Jonsson*, 1934.

In two cases there were fractures of the tibia, which must be put in immediate connection with the operation. In both cases it was a question of infractions of no importance for the subsequent function.

It has already been mentioned that the operation was not undertaken until there was reason to assume that the tuberculous process had passed over to the healing stage. In spite of this, however, undoubted progression of the process could be radiologically established in 3 cases, further vertebrae having been attacked.

Case 11/1927 is of some interest. After one year and nine months' treatment in a plaster bed, the patient was operated on at six years of age. The process was localized to D IX—XII. Some months later a fracture of the implanted graft was discovered, which subsequently healed. At an after-examination when the patient was 15 years old a clinically typical kyphosis

Site	Back Status	Comments
		Fracture of the graft Died of meningitis 3 yrs after operation
L II—L III	Back mobile, fully normal	
D XIII—L I	Back mobile. Long-arched kyphosis No trouble	
D VI—IX	Back fixed with extreme gibbosity. No subjective symptoms	
D II—V	Slight gibbosity in upper dorsal region. Lumbar part mobile	
L II—L III	No subj. symptoms	

juvenilis with pronounced wedgeshaped vertebrae was observed on the X-ray picture.

The connexion between tuberculous spondylitis and juvenile kyphosis has been stressed by *R. Hansson*. In these cases it is possible that the kyphosis is a reaction against the ankylosed lower dorsal and lumbar portion brought about by the tuberculous process and the operation. The exact mechanism, however, has not been elucidated in these cases.

With reference to the material as a whole it may be said that of the 20 cases the result must be described as good in 15 cases, not quite satisfactory in 2, and bad in 2, while death occurred in 1 case in connection with the operation.

LITERATURE

Albee: Amer. Journ. of Surg., Vol. 21, 1933.

Freund: Journ. of Bone Joint Surg., Vol. 31, 1935, p. 752.

Hansson: Lecture at the Northern Orthop. Ass., 1932.

Johansson, Sven: Bidrag till k nned. och behandl. av ben- och ledg ngstbc. under barn ldern. Svenska l kars llskapetets f rhandlingar 1924.

Langenskiöld: Finska Läkarsällskapets Handlingar, Vol. 65, 1923, p. 297.

Maffé: Quot. from Johansson.

Mauclaire: Quot. from Johansson.

Sorrel: Presse Médicale, 1921.

Waldenström: Acta Chir. Scand., Vol. 56, 1924, p. 463.