

BILATERAL TUBERCULOUS LOCALISATIONS ON THE SKELETON

By

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The symmetrical affection of the skeleton is a not uncommon phenomenon in the evolution of different morbid conditions of the skeletal system. The bilaterality in the tuberculous arthritis, osteoarthritis or even osteitis has always been described as a rare phenomenon although very little is written on this subject.

In a paper published previously the authors were able to take statistical data from a material consisting of 1,895 patients with skeletal tuberculosis treated in the K. V. Kustsanatorium, during a 15-year period (1936 up to 1950). Among these patients 2,376 localisations were observed, 1,053 of which were referred to the large joints of the limbs (including the sacroiliac joints too). 24 were bilateral cases but only 20 of them were decidedly bilateral tuberculous cases while the remaining 4 cases were uncertain for a bilateral tuberculous disease. Thus the percentage of the decidedly bilateral localisations was found in this series as high as 1.89 per cent of the number of localisations on the large joints or 0.84 per cent of the total number of localisations. It becomes obvious that if the bilateral tuberculous arthritis cases are not very often seen, they cannot at any rate be considered as rare phenomena.

The literature on this question is rather poor, especially in Scandinavia. The authors were able to collect only sporadic references and those mainly from general statistical works on skeletal tuberculosis. A more extensive description of the subject was therefore found to be worthy of separate publication and the following few pages are dedicated to this purpose. Because the number of bilateral cases in the present series is relatively small, no statistical data or conclusions of general importance of any value can be taken, so that only a general aspect and some suggestions are given on the whole subject.

TABLE I
The Bilaterality among the Arthritis Cases.

	Sacro- iliac	Hip ¹	Knee	Ankle	Wrist	Elbow	Shoul- der	Total
Left-sided.....	55	136	105		85	34	38	26 479
Right-sided...	51	157	125		75	29	44	39 520
Bilateral	3(2) ²	9(7)	4(3)		2	2	2	2 24(20)
Percentage of bilaterality	2.67(1.78)	2.85(2.22)	1.68(1.26)	1.21	2.89	2.32	2.89	2.27(1.89)
Total ³	112	315	238	164	69	86	69	1.053

In this way among the different bilateral localisations those of the wrist and the shoulder were the most common (2.89 per cent), those of the ankle the most rare (1.21 per cent) and those of the other joints were placed between them.

The respective figures given by other authors were found as follows: The bilaterality on the hip was according to Johansson 6.25 per cent, Sinding-Larsen 3.0 per cent, Nussbaum 2.7 per cent, Wacchelli 1.3 per cent, Sorrel 1.3 per cent, Garophalides 1.0 per cent and Bruns-Wagner 0.5 per cent. The knee joint was found bilaterally affected in 1.53 per cent according to Johansson and 1.69 per cent according to Saccos. Sisefsky (1933) observed 5 bilateral cases of sacroilitis among 107 localisations on these joints. In one of his 5 cases the affection was decidedly bilateral while in 2 other cases the affection was most likely so and in still another 2 cases was possibly so. Allaria (1951) observed 13 bilateral cases among 143 sacroilitis, a percentage of 9 per cent and Casuccio and Longhi (1951) 3 bilateral among 164 cases (1.85 per cent). The elbow was affected bilaterally in one case in Johansson's series, i.e., 3.22 per cent and the shoulder in another case in Sorrel's series, i.e., 1.38 per cent. For the other joints none of the above-mentioned authors refers to any observed case among their material.

Besides the arthritis cases, five more cases of osteitis of the type of spina ventosa were observed symmetrically affecting the skeleton. These were two cases of bilateral spina ventosa of the metacarpals, two other of the metatarsals and one of the tibia. The respective percentages among the total number of localisations on the same bones were 4.16 per cent, 9.09 per cent and 9.09 per cent. Although the present authors were not able to find in the literature any other report on this point for comparison, it seems that the bilaterality among the osteitis cases is much more frequent than among the arthritis cases.

¹ Osteitis cases of the trochanter major are not included in the present table.

² In parentheses the number of decidedly bilateral cases.

³ Bilateral cases are calculated as double.

TABLE
The decide

Case no.	Hospital no.	Age of the patient at the time of first symptoms of the disease	Sex	Diagnosis	Date of onset of symptoms on		Clinical symptoms				
					The one joint	The other joint	From the joint		Abscess		Sinus
							R.	L.	R.	L.	R.
1	57/38	43 years	♀	Status post spondylitis T-L cum paresis + <i>Coxitis tbc. bilateralis.</i>	Left hip Jan. 1943	Right hip Nov. 1948	+	+	-	+	-
2	53/42	7 "	♀	Stat. post lymphad. tbc. colli + <i>Coxitis tbc. bilat.</i> + spondylitis tbc. lumbalis.	Left hip Jan. 1943	Right hip March 1943	+	+	-	-	-
3	18/44	6 "	♀	<i>Coxitis tbc. bilat.</i> + tbc. renis sin.	Left hip 1935	Right hip 1943	+	+	+	+	+
4	142/40	1 "	♀	Status post <i>coxitis tbc. sin.</i> + <i>Coxitis tbc. dx. cum fistula.</i>	Left hip 1929	Right hip July 1940	+	+	+	+	+
5	443/36	4 "	♀	<i>Coxitis tbc. bilat. cum fistulae</i> + Spondylitis tbc. thoracalis.	Left hip 1926	Right hip 1926	+	+	+	+	+
6	4/41	7 "	♂	<i>Coxitis tbc. dx. et sin.</i> + Conjunctivitis phlyctenulosa.	Right hip Nov. 1941	Left hip 1941	+	-	-	-	-

TABLE II
lateral cases.

Diagnosis based on						Treatment				End Results
rays	Cuti reactions	Guineapig test		Pad		Conservative		Operative		
		R.	L.	R.	L.	R.	L.	R.	L.	
+	+	-	-	-	-	+	+	-	-	Still under treatment in the K.V.K. Both hip joints almost totally ankylosed in good functional position. 5 cm real shortening of the left leg. Walking exercises with the aid of leather supports and crutches for both sides.
+	+	-	-	-	-	+	+	-	-	Still under treatment in the K.V.K. Both hips totally bony ankylosed in good functional position. No discrepancy in length. She walks with the aid of crutches, but without an support.
+	+	-	-	-	-	-	+	+	-	Discharged from the hospital in good general condition. Right hip joint. Movements: Extension 0°, flexion 50°, adduction 0°, abduction 40°, rotation 10-15° Left hip joint. Movements: Extension 0°, flexion 45°, abduction 0°, adduction 25°, rotation ? 10 cm real shortening of the right leg.
+	+	-	-	-	-	+	+	-	-	Discharged from the hospital in good general condition. Left hip joint bony ankylosed in good functional position. Right hip joint. Movements: Extension 5-10° flexion 40-50°, abduction-adduction 0°, small rotations movements. 3 cm real shortening of the right leg.
+	+	-	-	-	-	+	+	-	-	Discharged from the hospital in good general condition. Both hip joints bony ankylosed in good functional position. Apparent shortening of about 8 cm at the left side.
+	+	+	+	+	+	+	-	-	+	Still under treatment in the K.V.K. The right hip joint bony ankylosed in good functional position. The left hip joint was operated on by an extra articular graft arthrodesis. Because of a fracture of the graft small movements occur in all directions. The patient is up and walks in with a plaster cast on the left hip and with crutches. 4 cm real shortening of the right leg.

TABL

Case no.	Hospital no.	Age of the patient at the time of first symptoms of the disease	Sex	Diagnosis	Date of onset of symptoms on		Clinical symptom				
					The one joint	The other joint	From the joint		Abscess		S nu
							R.	L.	R.	L.	
7	38/36	9 years	♀	<i>Coxitis tbc. dx. inveterata</i> + <i>Coxitis tbc. sin.</i>	Right hip 1926	Left hip Nov. 1933	+	+	-	-	-
8	39/36	25 ..	♂	<i>Coxitis tbc. dx. + Tbc. articul. sacroiliac. bilat.</i> + <i>Arthrosis deform. cox. sin.</i>	Left 1934 (Roentgenological finding)	Right 1934 (Roentgenological finding)	-	-	-	-	-
9	83/40	18 ..	♀	<i>Tbc. sacroiliacae dx. et sin.</i> + abscessu fossae iliacaе dx.	Right 1940	Left 1940	-	-	+	-	+
10	62/44	25 ..	♂	<i>Tbc. genu amborum + Tbc. calcane. sin. + Tbc. carpi amborum + Tbc. falang. I dig. V man. dx. + Tbc. flang. I pollicis sin. + Tbc. pulm. amborum + Tbc. peritonei.</i>	Left Dec. 1943	Right Dec. 1943	+	+	-	-	-
11	58/48	39 ..	♂	<i>Pneumonia tbc.? dx. + Stat. post. spond. tbc. + Stat. post. omarthrit. tbc. dx. + Stat. post. gonit. tbc. dx. + Gonitis tbc. sin.</i>	Right ?	Left April 1948	+	+	-	+	-
12	149/43	16 ..	♂	<i>Tbc. genu dx. + Tbc. genu sin. operat. + Tbc. pulmon. dx. sanat.</i>	Right May 1932	Left May 1932	+	+	-	-	-

continued)

Diagnosis based on				Treatment				End Results			
X-rays		Cuti reactions	Guineapig test		Pad		Con-servative		Opera-tive		
R.	L.		R.	L.	R.	L.	R.		L.	R.	L.
+	+	+	-	-	-	-	+	+	-	-	Discharged from the hospital in good general condition. The right hip joint bony ankylosed in good functional position. Left hip joint. Movements: Extension 0°, flexion 30°, abduction 10°, adduction 0°, in-outrotation 0°. 5 cm real shortening of the right leg.
+	+	+	-	-	-	-	+	+	-	-	Discharged from the hospital in good general condition. No discomfort from the sacroiliac joints.
+	+	+	-	-	-	-	+	+	-	-	Discharged from the hospital in good general condition. No discomfort from the sacroiliac joints.
+	+	+	+	-	-	-	+	+	-	-	Remitted by his own wish to another hospital in a very severe general condition and with prognosis pessima.
+	+	+	-	+	-	-	+	+	-	-	Treated in the hospital only for a period of two months because of a pneumonia, while he was in a convalescent center in Vejbystrand because of his general condition. Remitted to another coastal Sanatorium for further treatment.
+	+	+	+	+	-	-	-	-	+	+	Discharged from the hospital in good general condition. Right knee joint bony ankylosed in 10° valgus position. Left knee joint bony ankylosed in 10° flexions position. The patients has leather supports for both sides.

TABLE I

Case no.	Hospital no.	Age of the patient at the time of first symptoms of the disease	Sex	Diagnosis	Date of onset of symptoms on		Clinical symptoms					
					The one joint	The other joint	From the joint		Abscess		Sinuses	
							R.	L.	R.	L.	R.	L.
13	168/42	22 years	♂	<i>Tbc. miliaris</i> (meningitis <i>tbc.</i> + Spondylitis <i>tbc. lumbal.</i> + <i>tbc. pulm.</i> + epididymitis <i>tbc. bilat.</i> + <i>tbc. gen. dx.</i> + <i>Tbc. talocrural. dx. cum fistula</i> + <i>tbc. tarsi sin.</i> + trochanter. <i>tbc. sin. cum fistul.</i>)	Right April 1942	Left July 1943	+	+	+	-	+	-
14	108/49	25 "	♀	<i>Tbc. articulatio talocrural. dx. et sin.</i> + <i>Tbc. articul. radiocarpal. dx. et sin.</i> + <i>tbc. articul. interphal. proximal. dig. III dx.</i> + <i>tbc. os. pubis dx.</i>	Right 1945	Left 1945	+	+	-	-	-	-
15	62/44 (same patient as in case no. 10)	25 "	♂	<i>Tbc. genu amborum</i> + <i>Tbc. calcanei sin.</i> + <i>Tbc. carpi amborum</i> + <i>Tbc. phalang. I dig. V man. dx.</i> + <i>Tbc. phalang. I pollicis sin.</i> + <i>Tbc. pulm. amborum</i> + <i>Tbc. peritonei.</i>	Right March 1943	Left March 1943	+	+	+	+	-	-
16	108/49 (same patient as in case no. 14)	25 "	♀	<i>Tbc. articul. talocrural. dx. et sin.</i> + <i>Tbc. os. pub. dx.</i> + <i>Tbc. articul. radiocarpal. dx. et sin.</i> + <i>Tbc. articul. interphal. proxim. dig. III dx.</i>	Right 1945	Left 1945	+	+	-	-	-	-
17	47/43	21 "	♀	Spondylitis <i>tbc. lumbosacral. cum fistul.</i> + <i>Tbc. art. sacroiliaca sin. cum fistul.</i> + <i>Tbc. costae</i> + <i>Tbc. cubiti bilater.</i>	Right Sept. 1942	Left Nov. 1942	-	+	+	+	+	+
18	23/40	23 "	♂	<i>Arthritis tbc. cubiti amborum cum abscessu</i> + <i>Coxitis tbc. sin.</i> + <i>osteitis tbc. sterni c. absce.</i> + <i>cachexia.</i>	Right Feb. 1940	Left Feb. 1940	+	+	+	+	+	+

continued)

Diagnosis based on				Treatment				End Results			
C-rays		Cuti reactions	Gui-neapig test		Pad		Con-serva-tive		Opera-tive		
R.	L.		R.	L.	R.	L.	R.		L.	R.	L.
+	+	+	-	-	-	-	+	+	-	-	Death.
+	+	+	-	-	-	-	+	-	-	+	Discharged from the hospital in good general condition. The left ankle joint bony ankylosed in right ankle. The right ankle. Movements: Dorsal extension 0°, plantar flexion 15°. Pronation, supination 15° respectively.
+	+	+	-	-	-	-	+	+	-	-	Same as in the case no. 10.
+	+	+	-	-	-	-	+	-	-	+	Discharged from the hospital in good general condition. Very limited movements in all directions. Has leather supports for both sides.
+	+	+	-	-	-	-	+	+	-	-	Discharged from the hospital in good general condition. Left elbow joint. Movements: Extension's defect of 45°, 70° flexion's range. 45° pro-supination. Right elbow joint. Bony ankylosed in 100° flexion. Minimal pro-supination's movements. Subluxation of the head of the radius.
-	+	+	+	-	-	-	+	+	-	-	Death.

TABLE

Case no.	Hospital no.	Age of the patient at the time of first symptoms of the disease	Sex	Diagnosis	Date of onset of symptoms on		Clinical symptoms					
					The one joint	The other joint	From the joint		Abscess		Sinus	
							R.	L.	R.	L.	R.	L.
19	180/41	60 years	♂	Tbc. pulm. bilat. + <i>Arthritis humero-scapularis bilat. tbc.</i>	Left Dec. 1940	Right 1941	-	+	-	+	-	-
20	63/40	6 "	♂	Periostitis alveolaris tbc. c. fist. + Lymphoma tbc. colli c. fist. + <i>Omarthritis tbc. bilat. c. fist.</i> + Spondylitis tbc. lumbal. + Keratoconjunctivitis phlyctenulosa dx.	Left Sept. 1940	Right Oct. 1940	-	+	+	-	-	-
					Bilateral cases of osteitis.							
21	85/45	22 "	♂	Spondylitis tbc. thoracal. c. abs. + <i>Tbc. tibiae ambor. c. fistul.</i> + Tbc. artic. talo-crural dx. c. fist. + Tbc. sterni c. fist + Tbc. lymphoglandul. colli c. fist. + Tbc. cubiti dx. c. fist. + Tbc. carpi sin. c. fist. + Amyloidosis organarum.	Right Jan. 1944	Left July 1945	+	-	+	+	+	-
22	14/40	16 "	♂	Spondyl. tbc. lumb. + <i>Spina ventosa multilocalisata man. dx. et sin. et ped. dx. et sin.</i> + Epididymitis tbc. bilat. + Tbc. ren. sin.	Right hand March 1939 Left foot 1938	Left hand April 1939 Right foot 1938	+	+	+	+	+	-
23	69/41	2 "	♀	Tbc. pulm. sin. sanata + Lymphoma tbc. colli c. fistul. + <i>Spina ventosa metatarsal. I bilat. et metacarpal. man. amb.</i> + Tuberculides extremit. infer. bilat.	Left hand March 1941 Left foot Jan. 1941	Right hand March 1941 Right foot Jan. 1941	+	+	+	+	+	-

(continued)

Diagnosis based on				Treatment				End Results			
X-rays		Cuti reactions	Guineapig test		Pad		Con-serva-tive		Opera-tive		
R.	L.		R.	L.	R.	L.	R.		L.	R.	L.
+	+	+	-	-	-	-	+	+	-	-	One month after his admission into the K.V.K. was remitted to another sanatorium and died there.
+	+	+	+	-	-	-	+	+	-	-	Discharged from the hospital in good general condition. Both shoulder joints have a nearly normal range of movements in all directions. The 2/3 of the movements are performed through the humeroscapular joint itself.
+	+	+	-	-	-	-	+	+	-	-	Death.
+	+	+	-	-	-	-	+	+	-	-	Discharged from the hospital in good general condition.
-	+						+	+	-	-	
+	+	+	-	-	-	-	+	+	-	-	Discharged from the hospital in good general condition.
-	+						+	+	-	-	

In the Table II more details on all the observed bilateral cases are given. Thus 25 bilateral localisations on the skeleton were observed among 21 patients. In four among them a double bilateral localisation was observed. The more detailed observations for each group of cases of the present series can be summarized as follows:

The bilateral coxitis were the most numerous cases. Most of them occurred in young girls, very few among males and adults. In two cases (No. 5 and 6) the onset was simultaneous in both hips. This fact according to Sorrel and Sorrel-Dejerine and Garophalides must be considered as much more uncommon than the bilaterality itself.

In all the cases the diagnosis was also based, apart from the history and the subjective symptoms and clinical signs, on X-ray films and cutireactions.

In most cases the treatment was conservative. In the few cases in which an operative treatment was considered necessary only a subtrochanteric osteotomy was performed in order to correct any existing malposition of the hip. (Case No. 3 and 6).

The end results were in all the cases rather good. No death had occurred among the bilateral coxitis. Among the 14 affected hips, in ten a bony ankylosis was the result of the treatment while in the remainder a certain degree of movement was preserved so that the patients had more facility to walk or sit.

The sacroiliac joint was in one case affected without any clinical or subjective symptoms and the diagnosis was in this instance a roentgenological finding. In case no. 9 an abscess in the right fossa iliaca was the first manifestation of the disease. Because an acute appendicitis was suspected the first time an operation was decided on but the finding of an extraperitoneal abscess led to the roentgen examination of the skeleton and only thus was the right diagnosis made. In both the cases the patients were young adult females.

Here also the diagnosis was based on both X-ray films and cuti-reactions and the treatment was always conservative. Although the prognosis of the localisation was bad, in the present cases the end results were very good. Both the patients were discharged from the hospital in good general condition and without any discomfort from the sacroiliac joints.

The knee joints were bilaterally affected in 3 cases and in all of them young male adults were the subjects. Both the joints were simultaneously affected in two cases (10 and 12).

The diagnosis, in addition to the X-ray films and cuti-reactions, was confirmed by a guinea-pig test in all the cases.

In one case (No. 10) the patient was remitted to another hospital

by his own wish and with prognosis pessima while in the remaining two cases the patients were discharged from the hospital in good general condition. Case No. 11 was remitted to another coastal Sanatorium for further treatment.

The ankle joints were affected bilaterally in two cases (one male and one female). The time elapsed between the affection of each joint was 15 months in the one case while in the other both joints were simultaneously affected. The death because of a miliary dissemination of the disease was the result in one of the cases.

Bilateral affection of *the wrist* was observed twice. In both cases the affection was simultaneous in both the joints. The patient was remitted to another hospital (same case as No. 10) in one case, while the other patient was discharged from the hospital in good general condition. The one patient was male and the other female.

Bilateral affection of *the elbows* was also twice observed (one male and one female). One death because of a cachexia occurred here too. In both cases the onset of the disease was about simultaneous (in case No. 17 a period of 3 months elapsed before the manifestation of the disease in the controlateral joint).

The shoulders were bilaterally affected in two other cases (both males). A period of some months had elapsed between the affection of each of the joints. The one patient was remitted to another hospital and died there.

As to the *osteitis*, in five cases a symmetrical affection of the skeleton was observed. In two patients the affection was double. Two of the patients were males and one female. One death because of an amyloidosis of the organs occurred among these three patients while the two others were discharged in very good general condition.

Although it is a very difficult matter to give any reasonable explanation of this phenomenon of bilaterality, one can draw some observations from the above material. In most cases the multilocalisation of the disease on the one hand and the high frequency of the mortality on the other are very strongly suggestive of a miliar dissemination of the disease. In these cases the bilateral affection of one or more joints of the same patient must be considered as a point of secondary importance and the bilaterality itself seems to be a rather incidental fact. On the other hand there are cases which must be considered as pure bilateral. Such are all the cases of coxitis, cases 8 and 9 (sacroilitis), and case 12 (gonitis). In these cases the selective localisation of the disease in a certain sort of joint is beyond discussion, although no reasonable explanation can be given of this peculiar

phenomenon. Perhaps predisposing anatomical and other factors can be causative but in the authors' opinion the problem needs further observation and study.

SUMMARY

Bilateral affection of the skeleton by tuberculosis was observed in 25 cases among 2,376 skeletal localisations on 1,895 patients treated in the K.V.K. during a 15-year period. 20 of them were arthritis and 5 osteitis cases of the type of spina ventosa.

Bilateral osteitis cases were found much more common (7.44 per cent) than bilateral arthritis (1.89 per cent).

Among the arthritis cases those of the wrist and the shoulder were the most frequently observed (2.89 per cent of a total of 1,053 articular localisations), while those of the ankle were seen least often (1.21 per cent).

Two categories of bilateral affections were observed. Those in which the bilaterality was the result of a miliar dissemination of the disease and the pure bilateral cases. In the latter no reasonable explanation of the bilaterality was possible in the authors' opinion. The whole problem needs further observation and study.

RESUME

25 cas d'affections bilatérales tuberculeuses du squelette ont été observés parmi 2,376 localisations squelettique constatées chez 1,895 malades traités au K.V.K. pendant une période de 15 ans (1936-1950). 20 étaient des arthrites et 5 des ostéites du type de spina ventosa.

Les ostéites bilatérales étaient beaucoup plus fréquentes (7.44 %) que les arthrites 1.89 %.

Parmi les arthrites, celles du poignet et de l'épaule étaient les plus fréquemment observées (2.89 %) sur un total de 1,053 localisations articulaires, tandis que celles du pied étaient les plus rares (1.21 %).

Deux catégories d'affections bilatérales ont été observées. Celles dans lesquelles la bilatéralité était le résultat d'une dissémination miliare de la maladie et celles des purs cas bilatéraux. Dans ces derniers aucune explication raisonnable de la bilatéralité n'a pu être donnée de l'avis des auteurs et pour résoudre ce problème, il faut des observations et des études plus étendues.

ZUSAMMENFASSUNG

Doppelseitige Affektion des Skelettes durch Tuberkulose wurde in 25 Fällen unter 2,376 Skelettlokalisationen an 1,895 Patienten, die an der K.V.K. während einer Periode von 15 Jahren behandelt wurden, beobachtet. 20 von diesen waren Arthritisfälle und 15 Ostitis der Spina ventosa-Type.

Bilaterale Ostitis wurde viel häufiger gefunden (7,44 %) als bilaterale Arthritis (1,59 %).

Unter den Arthritisfällen zeigte sich häufigst Erkranktsein des Handgelenks und der Schulter (2,89 %) bei einer Gesamtsumme von 1054 Gelenkslokalisationen, während das Sprunggelenk die Erkrankung am seltensten aufwies (1,21 %).

Zweierlei Kategorien von doppelseitigen Erkrankungen wurden beobachtet. Solche bei denen die Doppelseitigkeit als das Resultat einer miliaren Ausbreitung der Erkrankung auftrat und andere – die reinen bilateralen Fälle. Für das Auftreten der Doppelseitigkeit in den letzteren Fällen gab es nach der Meinung der Verfasser keine plausible Erklärung, und das gesamte Problem benötigt weitere Beobachtung und Untersuchungen.

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