

“KISSING-SPINE” SYNDROME IN THE LIGHT OF AUTOPSY FINDINGS

By

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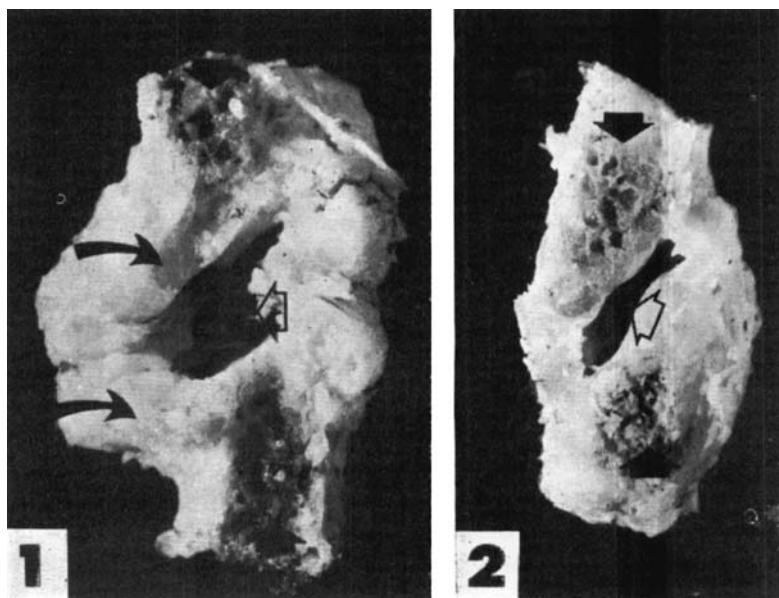
The first worker to report roentgenologico-clinically on the syndrome which is often called Baastrup's disease, was *Baastrup* (1933 a, 1933 b), after whom it was named. He noted that the tips of the spinous processes are pressed against one another when lordosis of the lumbar spine is intensified for one reason or another and in consequence of the resulting trauma hemorrhages develop, initially in the interspinous tissue. Later, the soft interspinous tissues are destroyed, the tips of the adjacent spinous processes move very close together and formations which are roentgenologically reminiscent of joints may develop. The tips of the spinous processes as it were “kiss one another” which has given rise to the name “kissing-spine” syndrome used by some workers and first introduced by *Brailsford*.

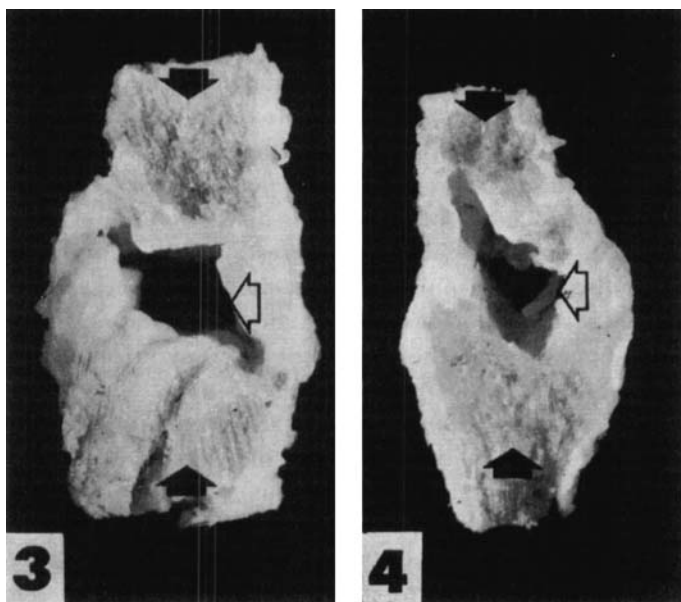
The “kissing-spine” syndrome has subsequently been studied by numerous workers from the roentgenological, clinical and therapeutical aspects (*Reinhardt* 1951, *Toison et al.* 1957, etc.). *Salvini* (1954) regarded the syndrome as congenital, rejecting the mechanical theory put forward by *Baastrup*. He stated that he had even established some degree of heredity. *Vilaseca et al.* (1953) reported that the disease occurs chiefly in women (77 per cent), during or after the menopause. It was reported by *Bachmann* (1956) that these changes in the spinous processes are more common than is believed; he established Baastrup's disease in 27 per cent of the roentgenograms of 70 patients. A method of treatment was introduced by *Franck* (1944) in which a part of the spinous processes is resected in the most severe “kissing-spine” cases. The present author has found nothing in the literature, however, on the macro- and microanatomical changes encountered in the spinous pro-

cesses and the soft parts between them, the interspinous ligaments, in cases of "kissing-spine".

Own investigations: Using an autopsy material, the spinous processes in the region of the lumbar spine and their interspinous ligaments were studied in a total of 306 dead bodies. Of them, 114 were children under 10 and the remainder, 192, represented fairly evenly all age groups up to 90. No changes indicative of Baastrup's disease were observed grossly or microscopically in the spinous processes and interspinous ligaments of the child material. The margins of the spinous processes were sharp in children, there were no faceted or articular surfaces and no osteophytes. This suggests that the "kissing-spine" syndrome cannot be a congenital disease but must develop later in life.

Incipient degenerative changes which are gradually intensified with age can be established histologically and histochemically in the lowest interspinous ligaments of the lumbar spine by around the age of 20. In consequence of these changes small cavities originate in the middle of the interspinous ligaments and the actual tendinous tissue is gradually destroyed until only a thin layer of ligament tissue remains on both margins of the ligament. At the same time, the corresponding interspinous ligaments thicken ostensibly measured from outside, from 1-2 mm. in young persons to as much as 10 mm. and more in thickness later





Figs. 1-4.

Frontal plane sections of spinous processes and their interspinous ligaments in cases of "kissing-spine" of different degrees of severity. Short black arrows in the upper and lower margins of the illustrations indicate cross-sections of the bony surfaces of the spinous processes. White arrows indicate small cavities reminiscent of joint cavities between the spinous processes and inside the interspinous ligaments. Black curved arrows indicate osteophytes at the margins of the spinous processes.

in life. With the thickening of the interspinous ligaments the corresponding margins of the spinous processes also thicken. The formation of cavities in the middle of the interspinous ligaments is so common that a cavity was demonstrated macroscopically in the ligaments of the LIV-LV space in 85 per cent of subjects of, say, 61-70 years of age (*Rissanen 1960*).

It is possible to find in typical cases of "kissing-spine" from an external examination of the spinous processes and their interspinous ligaments that the ligaments are always markedly thickened. Osteophytes often seem to form on the margins of facing spinous processes, on the lateral sides. These osteophytes constitute a typical aspect of this disease (*Fig. 1*). The tips of the spinous processes either project until they are together or separated by a narrow slit only. Outwardly the interspinous ligaments may consequently appear perfectly intact, merely noticeably thick.

The macroanatomical changes that have developed in the spinous processes and interspinous ligaments in Baastrup's disease can be seen more distinctly in a frontal plane section running via the spinous processes and the interspinous ligament between them (Figs. 1-4). It can often be seen how the margins of the facing spinous processes have shaped themselves into oblique faceted surfaces (Figs. 1-2) which slide against one another easily when the tips of the spinous processes are pressed together. The pearly grey colour characteristic of the articular surfaces is often visible on the faceted surfaces. There is generally a large cavity in the middle of the interspinous ligaments and sometimes thin membranes on both margins are all that remain of the true ligament. The ligament tissue may also be destroyed completely in places.

It is easy to discriminate macroanatomically between pronounced and typical "kissing-spine" cases. But it is difficult to draw a line between cases in which the changes are mild and normal spinous processes since there are numerous transitional forms between normal and the "kissing-spine" condition. Approximation of the tips of the spinous processes to one another occurs with increasing age in most cases and most extensively in the lowest lumbar vertebrae. There is concomitant cavity formation in the middle of the interspinous ligaments and the margins of the spinous processes are thickened. As already mentioned, a major or minor cavity was found on macroscopical examination in the middle of the interspinous ligament of the LIV-LV space in 85 per cent of subjects aged 61-70. The larger the cavity the closer together were the tips of the spinous processes as a rule and, consequently, the greater their resemblance to "kissing-spine".

Tissue resembling hyaline cartilage can be demonstrated microscopically in typical cases of Baastrup's disease in the spinous process margins that have turned to face one another (Fig. 5). This tissue shows cartilaginous cell capsules in the middle of metachromatically staining ground substance.

Metaplastic cartilage originates in "kissing-spine" next to the bony surface of the spinous process. All the cases examined by the present author, however, involved, at least in places, tissue resembling markedly degenerated hyaline cartilage in which the majority of the cells were necrotised. On the other hand, large colonies of cartilage cells were visible in parts; they sometimes consisted of even tens of cells, some and in places even all of them necrotic. Toluidine blue and Alcian blue staining sometimes revealed the disappearance of metachromasia or

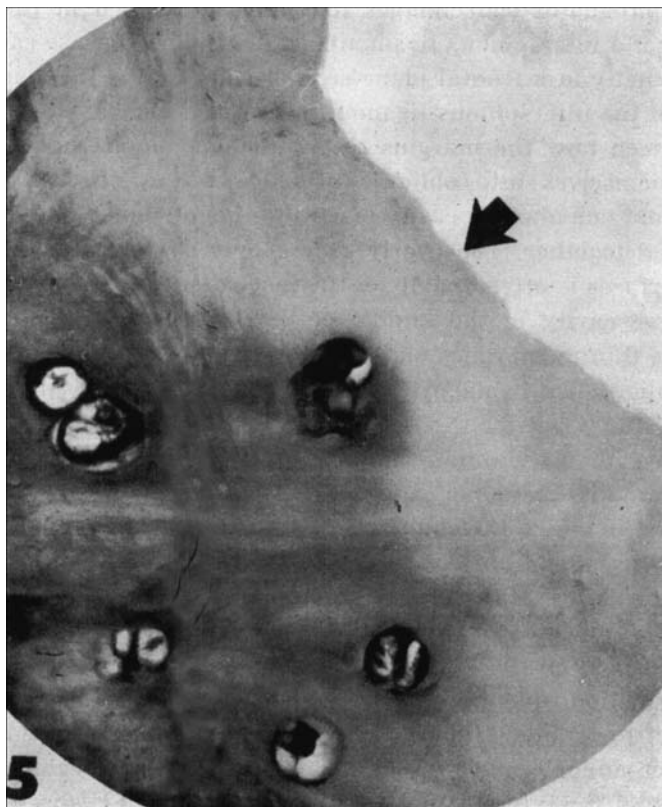


Fig. 5.

Edge of a cavity (arrow) seen from the side of the spinous process in a typical case of Baastrup's disease. Metaplastic tissue resembling hyaline cartilage tissue, no longer any metachromatic staining in the marginal parts. Toluidine blue. $\times 400$.

its weakening in the marginal parts although it was still intense in the inner parts.

A mesothelial covering which circumscribed the cavities was often demonstrable microscopically on both lateral sides of the interspinous ligaments (Fig. 6). Folds, villi, which could be lined by a layer of cells, pushed from here into the cavity in places. The "kissing-spine" cases consequently showed a cavity in the middle of the interspinous ligaments, sometimes bounded towards the spinous processes by tissue resembling joint cartilage and in the lateral direction often by a formation reminiscent of the articular capsule and containing a synovial membrane. Macro- and microanatomically demonstrable joints thus

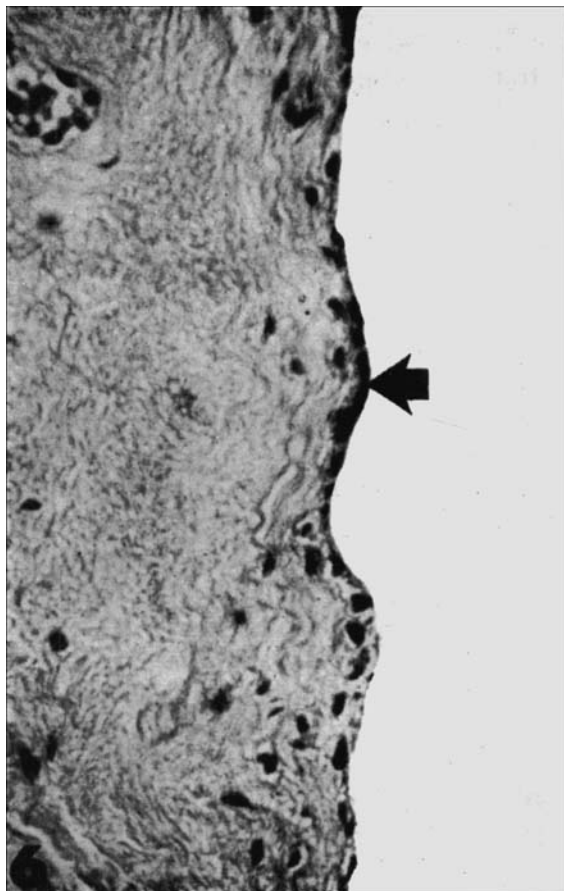


Fig. 6.

Edge of a cavity (arrow) seen from the lateral aspect in a typical case of Baastrup's disease. Loose connective tissue bounded towards the cavity by a layer of mesothelial cells. Toluidine blue. $\times 400$.

formed between the tips of the spinous processes in the "kissing-spine" cases.

DISCUSSION

Judging by the material studied, Baastrup's disease is certainly not a congenital disease but develops gradually during life when the tips of the spinous processes move together for some reason or other. Although cases of pronounced "kissing-spine" were relatively rare in the adult material, milder cases were numerous from roentgenograms.

Bachmann (1956) reported changes indicative of Baastrup's disease in 27 per cent of his cases. Changes suggestive of this disease are still more readily demonstrable at autopsy, the number of cases increasing with the age of the material. Changes suggestive of Baastrup's disease are very common after middle age. Changes of this type very probably have a prominent role in the production of low back pain when the involvement is still mild.

SUMMARY

The spinous processes of the lumbar spine and the soft parts between were studied in 306 dead bodies for the presence of Baastrup's disease. 114 were children under 10 and the remainder were evenly distributed by age up to 90. No "kissing-spine" was seen among the children. The disease must consequently develop during life. The macroscopical findings in typical "kissing-spine" cases are thickening of the spinous processes, oblique facets which often develop at the points of contact of the tips and small cavities resembling joint cavities which form in the middle of the interspinous ligaments. Microscopical study discloses tissue components typical of joints, and thus true neoartikli form in these cases between the tips of the spinous processes.

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RESUME

Les apophyses épineuses de la colonne vertébrale lombaire et des parties molles intermédiaires ont été étudiées sur 306 cadavres pour rechercher la présence de la maladie de Baastrup. 114 étaient des enfants de moins de 10 ans, les autres étaient répartis dans toutes les catégories d'âges jusqu'à 90 ans. On n'a pas constaté d'altérations chez les enfants. C'est donc que la maladie se développe dans le courant de la vie. Les trouvailles macroscopiques furent dans les cas de "kissing spine" un épaississement des apophyses épineuses, le développement de facettes obliques sur les points de contact entre les apophyses et la formation de petites cavités, ressemblant aux cavités articulaires, dans les ligaments interosseux. Une étude microscopique a révélé dans ce tissu les composants typiques des articulations et par conséquent, dans ces cas, une véritable forme néoarticulaire entre les apophyses épineuses.

ZUSAMMENFASSUNG

Die processus spinosi und die Weichteile zwischen ihnen wurden unter Hinblick auf das Vorhandensein von Baastrups Erkrankung bei 306 Leichen untersucht. 114 waren Kinder unter 10 Jahren und die übrigen zeigten eine gleichmässige Altersverteilung bis zu 90 Jahren. Keinerlei Berührung der Dornfortsätze wurde bei Kindern angetroffen. Die Erkrankung muss sich daher während des Lebens entwickeln. Die makroskopischen Befunde bei typischer Berührung der Dornfortsätze “Kissing-Spine” sind Verdickung der Dornfortsätze, schräge Facetten, die sich oft an den Berührungspunkten der Spitzen entwickeln, und kleine Hohlräume, die Gelenkshöhlen ähnlich sind und die sich oft in der Mitte der ligg. interspinalia bilden. Mikroskopische Untersuchungen enthüllen Gewebskomponenten wie sie für Gelenke typisch sind und es bilden sich daher in diesen Fällen echte Neoarthrosen zwischen den Spitzen der Dornfortsätze aus.

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