Translation of a classic paper

On generalised septic vessel diseases

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In the investigation of cases of sepsis with generalised vessel changes a particularly striking disease picture can be distinguished.

This is a report on the findings in a 38 year old man (case 1) and a 36 year old (case 2) and a 33 year old woman (case 3) in whom the clinical symptoms and course of the disease for the most part showed agreement, with a duration of four to seven months, a septic disease picture with a temperature of 39.5°C, blood cultures always negative, and a much raised erythrocyte sedimentation rate. The Wassermann test was negative several times in blood and cerebrospinal fluid in all three cases and there was moderate anaemia. Typhoid and paratyphoid agglutination tests and Bang, Flexner, Y, and Weil tests were negative. The disease started with rhinitis and stomatitis, pharyngitis, laryngitis, and tracheitis followed. The nasal process predominated, with the formation of foul smelling scabs. In the first two cases a perforation of the septum developed, and in the 38 year old man a saddleback nose. Complications that occurred in the later course of the disease were protein in the urine and erythrocytes in the sediment, along with leucocytes and hyaline and granular casts; the Esbach test for protein gave a value of $\frac{1}{4}$ – $\frac{1}{2}$ %. The blood pressure was not raised, but in the first case blood urea increased to 196 mg, with uraemic symptoms. There was complete anuria in the third case. In the first two cases pneumonic symptoms and a peculiar herpetiform skin eruption occurred shortly before death.

CASE 1 Main necropsy findings: Necrotic process of the internal nose and paranasal sinuses with extensive destruction of the septum and of the conchae. Ulcerous necrotising stomatitis, laryngitis, pharyngitis, and tracheitis with miliary nodule formation. Infarction like foci in both lungs with cavernous cavitation. Large mottled kidneys with blurred markings and haemorrhages.

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Microscopy: There were recent and older stages of periarteritis nodosa in the gall bladder, testes, epididymis, urinary bladder, diaphragm, rectum, appendix, adrenals, and abdominal skin. The kidneys similarly showed arterial changes in the form of polyarteritis nodosa, and also at numerous glomeruli circumscribed loop necroses, roughly with the appearances of a localised glomerulonephritis; in places there was also an increase in the capsule epithelial cells with a suggestion of half moon formation. The most striking changes, however, were periglomerular granulomas diffusely distributed in both kidneys, consisting of radially arranged fibroblasts, permeated or surrounded like an areola by polymorphonuclear leucocytes, predominantly lymphocytes and plasma cells. Within the granulomas the glomeruli were sometimes almost necrotic or completely destroyed, or converted into a loose connective tissue structure permeated by the cells of the granuloma, sometimes with partial or total hyalinisation. There was extensive leucocytic lymphocytic infiltration of the interstitium with atrophy of the renal tubules and numerous hyaline casts.

Inside the nose, besides extensive necrosis, there was cell rich granulation tissue with granuloma like perivascular "epithelioid cell" foci and nodular necrosis, similar to those found in the pharynx, the larynx, and trachea, within the mucous membrane and sometimes in deeper layers.

In both lungs the infarction like necrosis and the most severe vessel changes were found in the marginal cicatricial connective tissue sections, with destruction of the elastic elements and intimal proliferation. The processes are probably essentially the same as the other extensive arterial changes.

In CASE 2 a necrotic process of the nose and paranasal sinuses was also found. There was ulcerous necrotic stomatitis, tracheitis, and bronchitis, with isolated, just visible nodule formation and bronchopneumonia of both lungs with circumscribed necrosis. Multiple older infarctions of the spleen and kidneys were seen.

Microscopy: Here there were also generalised arterial changes in the form of polyarteritis nodosa of the gall

bladder, liver, spleen, heart, stomach, duodenum, ileum, diaphragm, and kidneys. As in the previous case, the picture was of a localised glomerulonephritis. Around numerous hyalinised glomeruli diffuse loose connective tissue and hyaline zones, which not infrequently showed a radial arrangement of the nuclei, were observed. Given the granulomas just described, this picture probably represents the end stage or healed stage of those with a more protracted course of the renal disease. The necrosis seen in the lungs also showed the vessel changes mentioned in the first case in the area surrounding them. There were nodular necrosis and granulomas in the nasal, pharyngeal, and tracheal mucosa.

In CASE 3, in which the skull cavity was not opened at necropsy, and thus not the inside of the nose, an ulcerous necrotising laryngitis and tracheitis was found, similarly with nodule formation. There was enlargement of both kidneys with blurred markings, haemorrhages, and also older infarctions. In addition, there was a typical flecked spleen, and thrombosis of the splenic, hepatic, and renal veins.

Microscopy: There was the picture of a localised glomerulonephritis in the kidneys. Changes in the form of a polyarteritis nodosa were found only in the spleen and inside and outside the fibrinoid necrotic and granulomatous vessel processes. As in the other two cases, there were localised granulomas, often of perivascular localisation, and necrosis in the larynx and trachea. Arteritic processes, sometimes with destruction of the wall, were found at individual pulmonary artery branches.

This presentation of three cases, with striking agreement between their clinical course and anatomical changes, is intended to emphasise the existence of a particularly well differentiated disease picture characterised by:

- (1) a septic course;
- (2) extremely severe necrotising granulomatous inflammation of the inner nose (in two cases with perforation of the septum), with involvement of the pharynx and larynx;
- (3) renal changes in the form of a toxic localised glomerulonephritis;
- (4) generalised arteritis with the picture of periarteritis nodosa.

This disease picture does not seem to have been recognised previously. In publications available to me there is a report by Klinger (*Frankf Z Pathol* 1931;42:455) of a case described as a borderline form of polyarteritis nodosa in which very severe nasal changes were also found. A more detailed description of the peculiar renal changes, especially in the first case; a precise differentiation of the renal findings; the interdependence and chronological sequence of the septic nasopharyngeal processes found, the arteritic processes and the renal changes; and their relationship to the reactivity of the body as a whole need not be given in the context of this short communication and is reserved for a more detailed later publication.

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