CHRONIC ATROPHIC PERICHONDritis

BY

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Sporadic reports of this rare syndrome have appeared ever since the original observation by Jaksch-Wartenhorst (1923) but, although its variations are now reasonably well-defined, there have been few clues as to its aetiology. That the syndrome seems to be related to rheumatoid arthritis is fairly clear, however. The patient may present with a polyarthritis closely resembling rheumatoid arthritis, or with swelling and redness of the skin over the ear and nose cartilages progressing to deformity of these organs. This may be accompanied by deafness, voice changes, dizziness, tinnitus, and involvement of the rib cage. Death is usually caused from severe respiratory obstruction and its complications due to collapse of the tracheal and laryngeal cartilages (Pearson, Kline, and Newcomer, 1960). Involvement of the myocardium has been described (Harders, 1954) and of the liver (Strobel and Siefert, 1961). A patient with most of the features of this syndrome was recently admitted to this hospital, and as there has been only one report of such a case in the British medical literature (Davies and Kelsall, 1961), we now record the second British case.

Case Report

A single woman aged 64 years, admitted to St. Bartholomew's Hospital on February 9, 1962, had been in good health until December, 1960, when she noticed some pain and swelling in the right ankle. One year later she developed pain and swelling in the left knee, and soon afterwards the right knee became similarly involved. The arthritis soon spread to affect the metacarpophalangeal and proximal interphalangeal joints of the fingers. It was accompanied by morning stiffness. Eventually most of the peripheral joints became affected by the arthritis, although the hips were not involved. There was no history of diarrhoea, urethral discharge, inflammation, or dryness of the eyes and mouth. In March, 1961, she developed a skin rash on the arms and the right knee. This did not resemble psoriasis and was labelled erythema marginatum. The progressive symptoms and signs of a polyarthritis similar to rheumatoid arthritis were accompanied by weight loss of about 14 lb. There was no family history of arthritis.

Examination.—She appeared pale and ill, with pain and swelling of the joints of the hands, knees, ankles, and

shoulders closely resembling rheumatoid arthritis. A marked feature was the translucent appearance of the skin, with a cyanotic tinge overlying the extensor aspects of the joints. There were no other findings of any note at that time.

The erythrocyte sedimentation rate was 140 mm. in the first hour (Westergren) and the haemoglobin 74 per cent. Haldane. The anaemia was normochromic in type. Examination of the bone marrow revealed no abnormality. The latex-fixation test was negative, and no L.E.-cells were observed. The direct Coombs test was negative, and no cold agglutinins were found. Red cell survival, as measured with chromium⁵¹ tagged red cells, was a little decreased. The highest reticulocyte count observed was 6.2 per cent. The chest radiograph was normal, and radiographs of the hands and feet revealed no rheumatoid erosions.

Progress.—She improved considerably with treatment on a régime of aspirin 3.6 gr. daily, phenylbutazone 100 mg. three times a day, and hydroxychloroquine 200 mg. three times a day. She was discharged on April 28, 1962, and remained in reasonable health, although by July of that year she had noticed persistent tinnitus in both ears and she had a recurrence of the rash on the forearms and left lower leg. By early September, 1962, she suffered a return of symptoms in both knees, and 3 weeks later complained of a change in her voice and of a troublesome bovine cough. She then developed dysphagia and vomiting and rapidly lost weight. An enlarged gland was noted in each axilla.

She was now re-admitted to hospital, and over the next 2 months her general condition rapidly deteriorated. The diagnosis remained obscure until shortly before her death, when bronchoscopy was carried out because of the symptoms of respiratory obstruction. It was then noted that there was gross softening of the tracheal cartilages. There was marked elevation and prominence of the costal-chondral junctions on the right side of the chest with depression of the sternum on that side. The joint symptoms had regressed, and while she was in hospital there was no obvious joint swelling. The ear cartilages appeared normal, but there was some deformity and collapse of the nasal cartilages. She died on November 30, 1962.

Post-Mortem Findings

The general appearance was that of a poorly-nourished elderly woman. The most obvious abnormality was noted in the rib cage, larynx, and

trachea. All the rib cartilages of both sides were irregularly eroded and separated from the surrounding perichondrium by a space which in some instances contained purulent exudate. The ribs themselves appeared somewhat porotic but were otherwise normal. The glottic opening of the larynx was very much reduced, apparently due to disappearance of the laryngeal cartilages with collapse of the soft tissues (Fig. 1).

Fig. 1.—Posterior view of larynx, showing narrowing of the glottis due to collapse of laryngeal cartilages.

The tracheal cartilages had been destroyed, and the wall of the trachea was soft and compressible. The lumen had in consequence become much reduced in size and the airway was occluded by mucus. There were multiple soft fibrous adhesions over the right lung, but otherwise there was no obvious lung disease. The main bronchi appeared to be affected by the same change as was present in the trachea, but it was difficult to establish whether cartilage was absent from the smaller bronchi. The aorta and coronary vessels showed moderate atherosclerotic changes, but the heart and abdominal contents revealed no obvious abnormality apart from slight ischaemic changes in the kidneys.

Examination of the left knee, right ankle, right second metacarpophalangeal, and both sternoclavicular joints showed no obvious macroscopic

abnormality apart from slight hyperaemia of the synovial membrane and non-specific pitting of the articular cartilage of the patella. The intervertebral disks, however, in the cervical region appeared to be destroyed, and there was some sclerosis of the bone adjacent to the disks. Early changes of a similar nature were seen in the lower thoracic and upper lumbar intervertebral disks (Fig. 2).

Fig. 2.—Lumbar spine, showing a faint crescentic reaction zone on either side of the intervertebral discs.

The ear cartilages appeared normal but the cartilagenous nasal septum showed destruction of the cartilage.

Histology

(a) *Costal Cartilages*.—There was a reduction in the size of the rib cartilage and, although its interior appeared virtually normal, its surface was irregularly pitted and eroded and lay in contact with a layer of granulation tissue. The latter contained many neutrophils, eosinophils, macrophages, lymphocytes, plasma cells, and some chondroclastic giant-cells. Outside this was a wide zone of fibrous tissue containing pockets of plasma cells (Figs 3 and 4). In places the eroded cartilage was separated from the granulation tissue by an exudate containing fibrin. In the fibrous zone isolated fragments of necrotic cartilage were surrounded by macrophages and giant cells. The changes were even more severe at the costo-chondral junction. The cartilage there was broken up into fragments, and the smaller ones were necrotic, lying more or less free in an abscess cavity along with fibrinous and some polynuclear exudate.

Fig. 3.—Transverse section of costal cartilage showing its separation from the perichondrium by a space containing exudate. The surface of the cartilage is irregularly pitted. Haematoxylin and eosin. $\times 8$.

Fig. 4.—High-power view of costal cartilage, showing granulation tissue and exudate in contact with the eroded cartilage on the left. Haematoxylin and Eosin $\times 135$.

Granulation tissue extended deeply into the marrow cavity of the adjacent rib, the end of which was enveloped by reparative callus. Newly-formed cartilage in this reparative tissue seemed to have provoked an intense inflammatory reaction with fibrinous exudation and karyorrhexis of polymorph nuclei. Around the whole area there was a thick fibrous zone developed from the perichondrium and periosteum.

(b) *Joints*.—Closely similar changes were seen in relation to the cartilage surfaces of articular joints and the intervertebral discs. In the knee joint, for instance, there was undermining of the hyaline cartilage by granulation tissue, and fibrous tissue penetrated deeply into the marrow spaces of the bone. The synovial membrane showed copious organizing fibrin on the surface. There was some proliferation of synovial lining cells and deep to this there was a broad zone of fibrotic granulation tissue containing haemosiderin-filled macrophages but few plasma cells. In a metacarpo-phalangeal joint, the articular cartilage was undermined by granulation tissue as well as by the spread of pannus from the synovial margins on to the articular surfaces. Similar changes were observed in the intervertebral synchondroses of the cervical and lumbar regions. It was noticeable that where the subchondral plate of bone was intact the cartilage of the disc appeared to be unharmed. In places, however, the subchondral plate was deficient, and here granulation tissue had developed with numerous chondroclastic giant-cells, and there was active erosion and undermining of the cartilage with focal polymorphonuclear exudation.

(c) *Nasal Septum*.—Much of the nasal cartilage had disappeared, being replaced by fibrous scar tissue or fibrotic granulation tissue. Where cartilage islands remained there was a brisk inflammatory reaction. The bony septum appeared normal except where it abutted on the cartilagenous septum.

(d) *Trachea and Bronchi*.—The cartilage rings and plates had completely disappeared, leaving only fibrous tissue in their place. There was no trace of the inflammatory reaction around the site where cartilage was formerly present.

(e) *Lymph Nodes*.—The bronchopulmonary and mediastinal lymph nodes showed non-specific changes apart from an odd vacuolated appearance due apparently to the disintegration of large spherical macrophages which were particularly numerous in

the follicles. These macrophages also occurred in the pulp and sinuses of the spleen.

(f) *Other Organs*.—The lungs showed only some emphysema, congestion, and oedema. The anterior border of the liver showed congestion, with marked dilatation of the sinusoids and focal fatty change. The rest of the organ seemed normal. The kidneys showed some ischaemic changes, and the thyroid showed foci of lymphocytes and plasma cell infiltration with Askanazy-cell change of thyroid epithelium in the vicinity. There was some epithelial hyperplasia and considerable reduction in the colloid content of the vesicles. The changes were not sufficiently striking to suggest Hashimoto's disease. The thymus showed only the usual fatty involution of the adult thymus. The other organs appeared normal for a person of her age.

Discussion

This syndrome of arthritis, destruction of the nasal cartilage, respiratory obstruction, episcleritis and iritis, voice change, middle and external ear involvement, and occasionally cardiac and hepatic complications forms a rare and interesting problem. The basic defect appears to be an intense inflammatory and degenerative process in cartilage resulting in its dissolution and replacement by fibrous connective tissue (Pearson and others, 1960). When the only other British case was reported by Davies and Kelsall (1961), less than twenty cases had been published in the literature. Strobel and Seifert (1961) have since reported another single example, and we add one more. It clearly remains therefore a rare syndrome. The greatest number reported in any single publication has been the six described by Bean (1960). Not every case has shown all the features described. The commonest presenting symptoms have been the arthritis, episcleritis, involvement of the larynx, and destruction of the nasal and ear cartilages. The patient usually first notices symptoms from one or other of these. The nose may become suddenly red, painful, and swollen, and this may be accompanied, preceded, or followed by, similar involvement of the external ear (Pearson and others, 1960; Harwood, 1958). There may be excessive lacrimation and rhinorrhoea (Bean, Drevets, and Chapman, 1958), or the patient may present with dyspnoea (Strobel and Seifert, 1961) or dysphagia and a sense of constriction in the throat (Davies and Kelsall, 1961). At an early stage in the disease there is frequently episcleritis and iritis (Harders, 1954; Bober and Czarniecki, 1955). It is common for arthritis to be a presenting or early

symptom (Rogers and Lansbury, 1955; Hilding, 1952) and this closely resembles rheumatoid arthritis, although the sacro-iliac joints are involved more prominently than is usual in the latter disease. There may be accompanying involvement of the costochondral cartilages and a low-grade fever (Bean and others, 1958) and the erythrocyte sedimentation rate is frequently markedly raised (Davies and Kelsall, 1961). There may be considerable weight loss and generalized lymph node enlargement (Harwood, 1958). Bence-Jones protein was observed in the urine in one patient (Davies and Kelsall, 1961) although there was no evidence of myelomatosis. Cataracts were observed by Hilding (1952) and a spontaneous pneumothorax by Harders (1954). Generalized osteoporosis has been noted several times (Harders, 1954; Klatskin and Katzenstein, 1958; Pearson and others, 1960). There is no obvious preponderance of either sex. The disease is subject to exacerbations and remissions over several years, and the prognosis is very variable. Subcutaneous nodules have been observed (Pearson and others, 1960), and anaemia has been noted frequently (Bober and Czarniecki, 1955; Bean and others, 1958; Davies and Kelsall, 1961). We found some evidence that the anaemia is haemolytic in type, and this has not been reported before. It is interesting that we also found changes in the thyroid gland that could suggest an early thyroiditis, as it is well known that the association of rheumatoid arthritis and Hashimoto's disease occurs more frequently than can be explained by chance (Buchanan, Crooks, Alexander, Koutras, Wayne, and Gray, 1961).

Eventually, the patient progresses to a state where there may be marked peripheral joint deformity and subluxation, with involvement of the cervical, thoracic, and lumbar spine. The external ear becomes markedly deformed ("cauliflower" ear) and the nose presents a saddle-type appearance. There is often giddiness and tinnitus and frequently marked deafness and stenosis of the external auditory canal. The deafness is due not only to this stenosis but also apparently to involvement of the middle and inner ear. There may be tenderness over the costochondral junctions, larynx, and trachea, and as in our case the patient may develop severe laryngeal stenosis. It is the involvement of the larynx, trachea, and bronchi which carries the greatest risk to life. Tracheostomy may help, though as there may be considerable collapse of the bronchi too it is usually of only temporary benefit. A remission may be induced by the use of corticosteroids (Pearson and others, 1960), and these hold out the only hope of treatment. Once the patient has

reached the stage of gross laryngo-tracheo-bronchial involvement the outlook for life is very poor indeed. As an added complication the ocular involvement may lead to blindness. The most likely theory advanced to date to explain this bizarre syndrome is that the patient develops hyper-sensitivity against a component shared by cartilage, the sclera, and the membranes of the middle and inner ear (Pearson and others, 1960). The resemblance to rheumatoid arthritis in many respects is certainly very striking, but clearly the aetiology as yet remains obscure.

Summary

A woman aged 64 years presented with progressive arthritis similar to rheumatoid arthritis together with a mild haemolytic anaemia. Later she developed destruction of the cartilage of the external ear, larynx, trachea, bronchi, and costochondral portion of the ribs, and also of the articular cartilage of the joints. *Post mortem* there was found to be severe stenosis of the larynx and total disappearance of cartilage in the trachea and probably the bronchi. The cartilage was broken up into fragments and was necrotic. It was surrounded by a zone of intense inflammation, and had been progressively replaced by fibrous scar tissue. This is a rare syndrome; the other reported cases are briefly discussed.

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Périchondrite chronique atrophique**RÉSUMÉ**

Une femme de 64 ans s'est présentée avec une arthrite progressive ressemblant à l'arthrite rhumatoïdale et une anémie hémolytique bénigne. Plus tard on observa la destruction du cartilage auriculaire, laryngien, trachéal, bronchique, costochondral et articulaire. A l'autopsie on trouva une sévère sténose du larynx et l'évanouissement total du cartilage trachéal et probablement bronchique. Le cartilage était brisé en fragments et nécrotique. Il était entouré d'une zone d'inflammation intense et portait des signes de remplacement progressif par le tissu cicatriciel fibreux. Ce syndrome est rare; on discute brièvement les autres cas rapportés.

Pericondritis crónica atrófica**SUMARIO**

Una mujer de 64 años se presentó con artritis progresiva, similar a la artritis reumatoide y con anemia hemolítica benigna. Luego se observó la destrucción del cartilago auricular, laríngeo, traqueal, bronquial, costochondral y articular. A la autopsia se vió una estenosis pronunciada de la laringe y la desaparición total del cartilago en la tráquea y probablemente en los bronquios. Se encontró el cartilago roto en fragmentos y necrótico. Alrededor hubo una zona de inflamación intensa con signos de substitución progresiva por el tejido cicatrizal fibroso. Este síndrome es raro; se discuten brevemente otros casos relatados.