

unless it is so loosely bound that it prefers to attach itself to the aggregated IgG that we used to absorb it.

DR. A. G. S. HILL (*Stoke Mandeville*) How much of the rheumatoid 19S is circulating in complex form?

DR. STANFORD Only in certain patients can one measure the 22S circulating antibodies which are thought to represent the binding of rheumatoid factor on to some of the 7S. I do not think this is taking place in the patient, it is purely in the methods that we are using to measure the antibody that the interference is taking place.

Aspects of Pathology in Rheumatoid Arthritis. By A. L. MACAFEE (*Orthopaedic Research Department, Musgrave Park Hospital, Balmoral, Belfast 9*).

In the 4 years between November, 1967, and October, 1971, a total of 631 total hip replacement operations have been carried out by the surgeons at the Withers Orthopaedic Centre, Musgrave Park Hospital. After each of these procedures the femoral head was retained for examination. A pilot study was aimed at investigating the clinical patterns of disease in cases of osteoarthritis and rheumatoid arthritis, by means of combining the clinical, radiological, and pathological changes.

Each specimen was fixed in formalin and stored in this state until examination. Colour photographs were taken at standard magnification of surface and cut sections. Haematoxylin and eosin stained microscopical slides were prepared from paraffin blocks and for the purpose of this paper special views were taken.

The evidence suggests that there are differences in the tissue changes of osteoarthritis and rheumatoid arthritis. The main features may be summarized as follows:

Observation	Rheumatoid arthritis	Osteoarthritis
Sphericity of femoral head	Retention	Loss
Osteophytes	Nil	Present
Trabeculae	Thin with abundant marrow	Thick with cysts
Surface of femoral head	Absence of cartilage Pannus replacement Subchondral cysts not a feature	Retention of cartilage at non pressure area Thickening of subchondral bone with many small cysts

No conclusions have been drawn as to the long-term effects of these differences on the final outcome of surgery.

The macroscopic changes seen in the tissues of the knee joint in an early case and a late case of rheumatoid arthritis may be compared in the light of the current practice of synovectomy.

Discussion

PROF. D. L. GARDNER (*London*) How many cases have you examined and what selection does this presentation represent?

MR. MACAFEE We have performed approximately 600 total hip replacements and we are collecting the femoral heads. About fifty have been examined for this small pilot study.

MR. G. BENTLEY (*Oxford*) You showed osteoarthritis with tufts of cartilage. Did you imply that this was cartilage arising from original cartilage, or regenerative tissue from the subchondral marrow? One theory is that

subchondral cysts in osteoarthritis are areas of pressure necrosis, due to high loading, rather than areas of expulsion of synovial fluid from the joint.

MR. MACAFEE I do not know the origin of cartilage tufts. It has been suggested that some patients with osteoarthritis improve with rest in bed. In addition osteotomy with subsequent change in the pressure areas is said to result in 'regeneration' as evidenced radiologically. There is no doubt that many patients do improve and so perhaps there is regeneration of cartilage. It is with this in mind that the current study is progressing.

Natural History of Rheumatoid Cervical Subluxations. By P. H. SMITH, J. SHARP, and J. H. KELLGREN (*Rheumatism Research Centre, University of Manchester*).

Luxation of cervical vertebrae is a common feature of rheumatoid arthritis. This study attempts to define its natural history and the factors influencing its progression.

Of the 962 in-patients with classical or definite rheumatoid arthritis who had had routine lateral radiographs in extension and flexion between 1955 and 1964, 150 were noted to have vertebral luxations. In 1969-70, the ninety survivors (including six who had had cervical fusions) were reviewed clinically and radiologically. The average follow-up was 7.8 years (range 5 to 14). The gap between atlas and odontoid inflexion was recorded in millimetres. Below C2, subluxation was expressed as a fraction of the diameter of the lower vertebrae.

The initial degree and site of subluxation in radiographs of 150 cases are tabulated below.

Subluxation	Grade	Forward subluxation (mm.)	No of cases
At C 1/2	2	3.5-5.0*	50†
	3	5.5-7.5*	34†
	4	8.0 and > *	19†
Below C2	2	0.126-0.25‡	66
	3	0.26-0.32‡	22
	4	0.33 and > ‡	3

* Forwards only

† 10 cases of downward luxation omitted

‡ Forwards and backwards

The radiological progress in 84 survivors (ninety minus six cervical fusion cases) is demonstrated below.

Diagram A omits seven cases of forward luxation which finally developed downward luxation; also four cases in which there was downward luxation both initially and finally. Diagram B hides the fact that backward luxations progress more favourably than forward luxations (Figure, opposite).

Subluxations below C2 occurred more commonly and severely with advancing age. Downward luxations were found to be rare below the age of 60, and forward subluxations at C1/2 were less related to age and disease duration.

At follow-up, 62 patients had taken steroids and 22 had had none. The incidence of subluxations at C1/2 and below C2 were identical in both groups. At C1/2 subluxations progressed more favourably in those not taking steroids.

No beneficial effect on the progress of subluxations could be demonstrated from the use of collars. In the seven seronegative patients, no radiological deterioration was noted.

(A) Subluxation at C1/2

		Total	5	14	25	11	55	
Initial	4	1				5	6	
	3	1	3	12	3		19	
	2	3	11	13	3		30	
	0							
Grade		0	2	3	4	Total		
			Final					

(B) Subluxation below C2

		Total	18	25	9	3	55	
Initial	4							
	3	2	5	3	1		11	
	2	16	20	6	2		44	
	0							
Grade		0	2	3	4	Total		
			Final					

Cord lesions were diagnosed in twenty patients at the first radiological examination. Of these fifteen had died at follow-up, but only two of their death certificates mentioned cord lesions.

Of the remaining 130 cases, four are known to have developed cord lesions and six symptoms suggestive of vertebral ischaemia; 52 patients have died. A study of cervical tables suggests that cervical subluxations *per se* do not significantly shorten life in patients with rheumatoid arthritis.

Discussion

DR. E. B. D. HAMILTON (*London*) I should like to know what happened subsequently to the four patients who developed spinal cord lesions? We have three patients with serious atlanto-axial subluxation who developed cord lesions while we were adopting a conservative policy. Two were then inoperable and in the third the odontoid peg had to be removed through the mouth. This patient survived and has done very well.

DR. SMITH Three of the four patients were operated upon; one died within 2 weeks and the other two are living, but with residual cord signs. The fourth patient died before surgery could be performed.

DR. P. H. N. WOOD (*Manchester*) Documentation of variation in natural history is crucial. How did you read the x rays? Did you randomize the films, re-read, and compare the results, and did you get any estimate of the measurement—remeasurement stability of these gradings.

DR. SMITH The initial and final x rays were randomized and read independently by two observers, and where there was a discrepancy they were re-read jointly.

DR. A. G. S. HILL (*Stoke Mandeville*) Your measurement assumes some enlargement from the divergence of the x rays.

DR. SMITH Below C1 they do not appear to do so, but at C1/2 measurements of forward luxation can be affected by different magnifications. This happened only occasionally in our series and was not found to be a significant source of error.

PROF. E. G. L. BYWATERS (*Taplow*) Prescribing collars is one thing; wearing them another. Which did you take?

DR. SMITH Collars were issued to 45 patients; nine were never worn and 22 were worn intermittently and then discarded. Of the remaining fourteen, four wore their collars most days or nights, three every day and most nights, and seven every day and night.

DR. P. H. N. WOOD (*Manchester*) The value of death certificates is often challenged. However, whether someone is alive or dead is a simple question, that can be answered accurately. It is useful to know whether patients of a particular type, such as those with cervical subluxation, have an increased mortality. We should make more use of this simple indicator of whether a particular condition is important in terms of survival.

Finger Flexion in Rheumatoid Arthritis. By JOHN COLVILLE (*Consultant Plastic Surgeon, Royal Victoria Hospital, Grosvenor Road, Belfast BT12 6BA*).

The term *dyscampsia* has been created to describe disability in finger flexion from whatever cause. In rheumatoid arthritis there are many causes of this condition and it is pointed out that these must be diagnosed precisely if those amenable to surgery are to be selected.

In considering the cause of *dyscampsia* the finger is viewed structurally. Increase in the bulk of the subcutaneous tissue which is often seen in acute inflammatory conditions prevents flexion and can be relieved only by reduction of the tension within the finger.

Dyscampsia due to tendon disease may be classified as follows:

- (1) *Paralytic*
This includes disuse atrophy, rheumatoid myopathy, and motor nerve compression.
- (2) *Disruptive*
This occurs mainly under the pulley areas of the digits and underneath the carpal tunnel. Partial disruption with cross adhesion may obscure the issue.
- (3) *Obstructive*
 - (a) Incipient or partial when the excursion of the tendon is impeded;
 - (b) Intermittent when it is occasionally completely obstructed;
 - (c) Fixed when the tendon is no longer able to pursue its normal excursion at that point.
- (4) *Imbalanced*
In this situation the weak flexor is unable to overcome the spasm or contracture of the intrinsic extensors.

Tendons are much more amenable to surgery than joints, and once a diagnosis has been established the appropriate surgical procedure gives good results with minimal inconvenience to the patient.

Dyscampsia may be directly due to joint disease. The denervation of a prophylactic synovectomy may render a painful joint functional again. At the other end of the scale the insertion of silastic joints is of considerable value in salvage procedures. Between these extremes of joint