FRAC TURES OF THE FEMORAL NECK.

By ARTHUR CHANCE.

The subject of fracture of the neck of the femur has recently become, in the journalistic phrase, "news". Formerly, this subject was a sore one. General practitioners came across these cases and found them difficult to dispose of. Physicians experienced them among their older patients and were naturally slow to hand them over to the surgeons, who could promise very little, and the surgeons themselves found them an unsolved problem. The introduction of newer operative methods, however, has changed the outlook for this fracture, and I propose here to relate my experiences and results by operation in 48 cases.

Of these 48 cases no less than 39 were in women. Seven were under 50 years, 12 between 50-60 years, 13 between 60-70, 15 between 70-80, and one was 80 years of age.

My interest in this method of treatment arose out of a visit to the clinics of Scandinavia in 1931, when I had the pleasure of meeting Dr. Sven Johansson, director of a large surgical hospital in Gothenburg. He does a wide range of surgical work, but is especially interested in casualty surgery. Some time after my visit to his clinic he sent me a pamphlet dealing with fracture of the neck of the femur. I looked at the title, did not feel particularly interested and filed the pamphlet away. However, in the course of my lectures on fractures at the College of Surgeons, I looked up the pamphlet again and found that I had missed something really worth while. I discussed the matter with my friend, Mr. Somerville-Large, and fired with enthusiasm he left shortly afterwards for Sweden and brought back with him a complete Johansson outfit. An apparatus was already on its way to me, and on April 5th, 1935, I did my first case. Before discussing the method, will you forgive me if I recall some anatomical points in connection with fracture of the femur?

Since the days of Astley Cooper it has been known that a fracture close to the head occurred by a twist and was likely to give non-union, whereas fracture in the region of the trochanters occurred by direct violence and nearly always resulted in union. It was obvious that these two types must be differentiated, but the practice of calling them extra-capsular and intra-capsular is a bad one, because the extent of the capsule is different on the front and back of the neck and is different in different individuals, and anyway you cannot see it in the x-ray picture. It is much more accurate, and, for various reasons which I will not go into, it is much more useful to adopt the modern classification, medial and lateral fractures, the medial ones being those medial to the inner border of the great trochanter, as seen in the x-ray, and the lateral being those from this to a line drawn obliquely upwards and outwards from the lesser trochanter.
The second anatomical point concerns the blood-supply. While the main blood-supply to the neck and head is by means of the blood-vessels passing up in the interior of the neck, the neck also receives some blood-vessels coming in from the capsule. The head, as shown by Chandler's post-mortem examinations, receives a considerable blood-supply from the ligamentum teres. This means that a fracture close to the head diminishes, but does not cut off, the blood-supply to the head, but fractures through the waist of the neck are more favourably situated because the proximal fragment may get some blood-supply from the capsular vessels. That the head is totally devascularised and undergoes an aseptic necrosis is no longer believed.

The third anatomical point to which I would like to refer is the fact that the lower part of the neck is the densest and strongest, and the dense cortical bone of the shaft tapers rapidly towards the great trochanters. The significance of this is, that the metal pin driven into the neck is better driven in through the lower margin of the neck and if you enter the pin too low in the shaft, you are prone to have difficulty owing to the extremely dense cortical bone.

Briefly, the method of Sven Johansson consists in reducing the fracture, in checking reduction by x-ray examination, in penetrating the fragments with a guide-wire, in ensuring by a second x-ray film that this guide-wire is centrally situated in the neck and head, and finally, in threading upon this guide-wire a three-bladed stainless steel pin of the Smith-Petersen pattern.

This method has the advantage of being theoretically perfect, because it fulfils the principles in the treatment of fractures, i.e., reduction, firm fixation during the period of union and simultaneous movement of all the surrounding muscles. Are these theoretical advantages realised? It seems to me that the members of the Academy would be interested less in the technical side of this procedure and more in knowing whether, in vulgar parlance, it "delivers the goods," and I propose to put forward a series of questions which I shall attempt to answer.

(1) Is the operation safe for old people?
(2) Is convalescence easy?
(3) How soon can they walk about independently?
(4) Do they get firm, bony union?
(5) What are the functional results?
(6) Are there any late disappointments?
(7) What is their condition one to two years afterwards?

Mortality. No case admitted to hospital was refused operation. All the patients, with one exception, have been traced, and 7 of the 48 patients are dead. Of these 5 died as a result of the operation, one I regret to say from a septic infection. How this infection occurred we have never been able to trace. The only way in which this operation differed from these in the other cases was that my regular assistant, Dr. Cherry, was absent at this operation.