that no proliferation ever exists in these cases and that curettage and primary closure are usually enough.

Osteitis Fibrosa Cystica. *Wis. Med. Jour.*, 1914-1915, xiii, 91-95, Smith.

Smith cites one case and believes this to be an inflammatory process. He puts marked emphasis on simple procedures in operative treatment.

Osteitis Fibrosa with Report of a Case. *Jour. Mich. Med. Soc.*, 1915, xiv, 46-48. Van Zurahowenburg.

He cites the radiograms of one case and proposes as a differential diagnosis:

1. From inflammation by absence of secondary reaction in neighboring parts.
2. From rickets by absence of characteristic changes in the epiphyses.
3. From metastatic carcinomata by absence of striations.
4. From sarcomata by multiplicity and tendency to rupture through thin bone, and presence of spicules radiating from point of primary growth.

He emphasizes the fact that in spontaneous fractures the repair is rapid if the cyst is not removed. Curettage should be done later.

Osteitis Fibrosa. Ballawa. *Med. Rec.*, 1915, LXXXVII, 539.

By presenting one case he endeavors to prove that these cases are metaplasias closely allied to ostitis deformans, osteomalacia, and rickets. He rather favors this as a secondary process in tuberculosis, particularly in the polycystic type. In the discussion, calcium therapy was urged but the author had used the same without results.

Osteochondrofibroma, or Osteitis Fibrosa. Gibney. *Med. Rec.*, 1916, LXXXIX, 1037.

Reports a case which he finally admits is probably osteochondrofibroma rather than ostitis fibrosa.

Case of Osteitis Fibroma Cysticus. Ramey. *Tex. State Jour. of Med.*, 1918, xiv, 16.

He reports a case involving the right femur and tibia in the diagnosis of which he differentiates from other conditions by stating that it rarely extends beyond the periosteum, is always confined to the shaft of the bone and never involves the epiphysis. He offers no theory as to the cause.

Fibrous Osteitis. *Internatl. Clinics*, 1918, 285, II, 74-79.

Two forms should be made, generalized and localized, both of traumatic origin. Further knowledge not possessed.

Osteitis Fibrosa. De Couny. *Jour. Am. Med. Assn.*, 1919, LXXII, 1612.

Reports a case the symptoms of which dated from a period shortly after a severe vaccination, therefore favoring infection as a cause. In this case the humerus was resected.

SUMMARY

The two theories, out of several that have been advocated by the individuals discussing these lesions, which seem most worthy of consideration because of their agreement with fundamental pathological processes, is the theory of (a) low grade inflammation and that of (b) endogenous metaplasia. It does not seem to me that trauma can be cited as playing a rôle which is causative, and as for syphilis, osteomyelitis, osteogenesis imperfecta, tuberculosis, Paget's disease, osteomalacia, giant celled sarcoma, or any other of the diseases cited having any close relation to the lesions of osteitis fibrosa, it does not appear that there is any convincing evidence.¹ Simple, free exposure of the lesion and curettage to solid bone offers a satisfactory solution of the problem of treatment.

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HIP FRACTURES WITH A REPORT OF FORTY-TWO CASES TREATED WITH THE FLEXED SPICA.

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IN 1916 I reported a small series of sixteen cases of hip fracture treated with a flexed spica cast and the sitting position during con-

valescence. There was one other case included in the series whose physical condition made it seem inadvisable to attempt any treatment. This patient died a few days after she was injured.

The frequent repetition of the expression that "there is nothing new under the sun," makes one hesitate to claim precedence in originating a new method of diagnosis or treatment. During the eight years that I have employed this method, I have been unable to find mention in surgical literature of hip fractures treated by immobilization with a spica cast in flexion and abduction prior to 1912, when I began using it.

To describe the method very briefly it may be stated that it is an adaptation of the abduction cast advocated by Whitman, which enables the patient to maintain a sitting position throughout convalescence with the injured leg immobilized.

A review of my case histories shows that, since the report of seventeen cases published in 1916, I have seen thirty-one cases of hip fracture, making a total of forty-eight patients. Forty-two of these patients have been treated with the flexed spica. Six were in such poor physical condition when seen that any treatment whatever seemed inadvisable. Five died a few days after injury while the sixth is still living.

This report is submitted with the realization that the series of treated cases is not a large one. There have been several reports in recent literature of a larger series; but being compiled from the records of the larger hospitals they represent in most instances the work of several surgeons. As obtains in most hospitals the number of methods used in treating hip fractures is frequently in excess of the number of surgeons on the staff. As a result, only in rare instances, is there a large series reported from any one clinic treated by the same method. We are also left in doubt by the majority of writers as to the age of the patients treated, the type of fracture and other essential data for basing our opinions regarding the value of the method of treatment carried out.

The series of cases here reported is made up of patients seen in private practice since 1912 with the exception of a few treated at the Brockton City Hospital from 1912 to 1916 inclusive. No case is included treated other than by myself.

Convalescence has frequently been cared for by the family physician as it is rarely necessary to keep patients in the hospital after they are accustomed to the cast.

There has been so much criticism in recent literature of the older methods of treating hip fractures, that it would seem a waste of time to consider this phase of the subject in detail here. Some good results have been obtained with every method that has ever been

used. In fact, good results have been obtained in certain cases with no treatment. The value of a method of treatment should be determined by its range of applicability, by its effective immobilization of the bone fragments, after they have been placed in apposition, and by the functional results obtained not only in the type of injuries that give satisfactory results with almost any treatment, but with the generally recognized difficult cases.

It is conceded by most surgeons that the fractures involving the great trochanter will unite by bony union under any circumstances provided the patient survives treatment. This is probably due to the fact, as shown by Lexer's study of the blood supply of the head and neck of the femur, that the blood supply to the proximal fragment in this type of fracture is little impaired. Disability in these cases is due to faulty position, adduction or coxa vara and loss of muscle balance. It is also conceded that with early recognition, proper reduction and immobilization non-union and imperfect function are extremely rare in children and young adults. Except in rare cases of general systemic disease, any method of treatment is well borne in the young. Bony union is the usual result even in the intracapsular fractures; joint and muscle function are quickly reestablished after treatment.

The real problems in the treatment of hip fractures are those that occur in patients past middle life, especially in the intracapsular type of fracture, either impacted or loose. A certain small percentage of this type of cases are healthy and robust and will tolerate any method of treatment. The majority however have a low reserve of energy, their physiologic balance is unstable, either as a result of senility or as more often occurs from systemic disease, to which the aged are prone. They are overwhelmed by the injury, grave symptoms of shock are presented and uraemia or other systemic conditions develop. If active measures are not instituted at once to combat these symptoms hypostatic pneumonia soon supervenes with the usual fatal result. In the past, it has been these types of cases that have made up the large majority of hopeless hip fractures. They have received either no treatment or treatment of the most perfunctory sort and have been doomed to an early death or invalidism for the rest of their days. The old ultra-conservative rule of "treat the patient then the fracture" has been followed with the result that the immediate mortality has remained unchanged and the percentage of life-long invalids is little lower than fifty years ago.

These are the types of patients for which the method of treatment to be described was devised. The cases here reported were in no way selected, but through good fortune they were in most instances the type of case suited to prove the efficiency of the method. The

average age of the forty-eight patients was sixty-five years, and four months.

The essentials in the successful treatment of fractures deserve particular emphasis in the handling of hip fractures. No fracture of a long bone in the body results in so great immediate mortality or so high percentage of disability following treatment. Early recognition and treatment are most essential to good functional results and should now be obsolete topics in surgical literature. Broadly speaking, the lack of observance of these principles is the cause of many poor results in the treatment of hip fractures. In an analysis of one hundred and twenty cases of ununited hip fractures treated at the Mayo Clinic, Henderson states that: "non-union in the majority resulted from incorrect diagnosis at the time of accident"—and—"In none of the cases in this series was there a history of really proper treatment for the fracture."

No fracture with displacement of the fragments gives a high percentage of good results if untreated for two or three weeks after injury. Industrial surgeons have shown that many of the crippling injuries of the hand are due to unrecognized and improperly treated fractures.

The question of reduction of hip fractures is still open. Certain factors enter into these fractures especially in the aged which obtain in no other long bone: absorption of the ends of fragments in loose fractures, poor reparative function of the bone and tearing of blood vessels with destruction of the remaining blood supply to the proximal fragment during reduction. These are some of the factors which have led often to unnecessary conservatism in the treatment of impacted fractures. Cotton has shown in his reimpaction method of treatment that impaction of the fragments is undoubtedly a factor in bony union of the neck of the femur even though it is recognized as unnecessary in other fractures. Sir Robert Jones states that "if the foot is in good position without any outward rotation and the shortening is not more than might be reasonably expected in any case, then it is not necessary to disimpact." Generally speaking the younger the patient, the wider the margin of safety in correcting deformities and the less likelihood of non-union following reductions.

The ideal reduction of fractures is reposition of the fragments to their original anatomical position. When this position is not attained we fail in accomplishing the ideal. In hip fractures especially in the aged the ideal reduction is frequently not obtained owing to the poor condition of the patient and the chance

of non-union following disemptions. In recent years the margin of safety in the active treatment of hip fractures in the aged has widened considerably and many patients who formerly received no treatment are now offered the opportunity of adequate reduction and immobilization.

I cannot subscribe to the statements of some recent writers that the problem of hip fractures is entirely a mechanical one and that we may correct deformities of the neck of the femur with as little hesitation as in the reduction of other bones. Treatment should be based primarily upon the patient's condition to withstand manipulation and the application of apparatus. Secondly the amount of deformity accepted as an indication for corrective measures should be in direct proportion to the age of the patient.

After reduction, the maintenance of the fragments in apposition is the primary object for which every method of treating hip fracture was devised.

Other considerations are prevention of muscle contractions, stiff joints, etc., but these are subordinate to the position of the fragments. Maintenance of apposition of the fragments must be constant throughout convalescence and in so far as any given method fails to constantly immobilize, it falls short of affording ideal conditions for union. Only one writer on hip fractures in recent literature, McGlannan, has favored motion of the fragments in hip fractures as an aid to union. All methods of treatment embodying a splint applied to the leg alone and not attached to the pelvis, as in the Jones abduction splint, fail to immobilize the upper fragment constantly. Each movement of the patient's body changes the position of the leg. In unimpacted fractures a certain amount of motion of the fragments is thus allowed, delaying union and probably in many cases is a factor in absorption of the ends of the fragments. Impactions are in many instances disengaged by the motion of the limb thus lessening the patient's chance of union.

If we accept the premise that immobilization of the fragments after anatomical reposition affords the ideal conditions for union, then all methods such as splint and traction to the leg, sand bags, etc., which do not fulfil these requirements, should be discarded in hip fractures, provided the patient can withstand treatment. The methods remaining are some form of splint, which immobilizes the trunk and pelvis with the leg, the best known being the Jones abduction splint, a plaster spica of the type advocated by Whitman, or a modification

FIG. 1.—Position in which the legs are held during the application of cast. Both legs are abducted as far as possible and upward, outward traction is maintained in the injured leg at the calf.

FIG. 2.—Side view before applying cast, showing flexion at right angles of thigh and leg.

FIG. 3.—Cast applied, thigh in complete abduction.

FIG. 4.—Side view of same patient.

FIG. 5.—Patient sitting in chair immediately after cast has hardened. This patient was not anaesthetized.

FIG. 6.—Loose intracapsular fracture after reduction, showing position maintained by cast.

of this cast which I have devised. The main features of these methods differ in no essential way.

The methods advocated by Sir Robert Jones and Whitman, similar to all of the older methods, require that the leg be placed in the same plane as the trunk, *i. e.* that the patient be either in the reclining position or standing. As few patients after a hip fracture are strong enough to assume the upright position, practically all are of necessity kept in bed. Prevention of complications incident to bed treatment of the aged is attained by raising the head of the bed and frequently turning the patient from one side to the other. Many patients especially the young and robust bear bed treatment well, the aged and infirm frequently are found to be poor subjects for these methods of treatment. The most common symptoms are cardiac failure and congestion of the lungs soon developing hypostatic pneumonia. When other methods of treating these complications are found of no avail, all restraining apparatus is removed and the patient placed in a wheel chair. In certain cases this is the only means that averts a fatal outcome. The patient recovers from the complications but as a result of lack of treatment of the fracture, non-union results and he spends the rest of his days on crutches or in a wheel chair.

In 1912 the idea occurred to me that there was another angle from which to attack this problem. We had depended upon treatment of complications after they had developed, rather than prevention of these complications. We had "locked the barn after the horse was stolen." Why should we not sit the patient up in a chair, with the leg immobilized in a cast in a sitting posture during the entire convalescence? Would we not by this means accomplish a double purpose, that of conserving the patient's strength and preventing cardiac and pulmonary complications and at the same time afford an opportunity to the fracture to unite?

The first patient upon whom this method was used was a man of seventy-eight having an extracapsular fracture. He was seen the day of his injury. He had incontinence of urine, was rather nervous and tremulous and appeared to be a poor risk. Under ether the fragments were reduced and the leg drawn down until it was the same length as the other. The thigh was then flexed at right angles with the trunk, the leg flexed at right angles with the thigh and both thighs abducted as far as possible. Strong upward traction was then maintained by an assistant upon the injured thigh and a cast applied from well above the rib margin to the calf. The patient was re-

turned to bed in the sitting position. The next morning he was placed in a wheel chair, where he spent every day thereafter during was uneventful except for incontinence of convalescence. This patient's convalescence urine which persisted for a few weeks necessitating the application of a new cast at the end of three weeks. The results obtained were so gratifying that I have since used this method as a routine in all cases in which any treatment seemed justified.

In the list of cases reported below, no mention is made of the method of treatment used as all but six were treated with the flexed spica.

No	Age	Male	Fem.	Intra	Imp	Loose	Ext.	Good	Poor	Results		
										Death	Treated	No Treat/No Reply
1	70	X					X	X				
2	61	X		X		X	X	X				
3	72		X	X		X				X	Decubitus	
4	67	X		X	X			X				
5	63		X	X		X					X	Death
6	67		X				X					X
7	44	X		X		X		X				
8	70	X					X	X				
9	69		X	X	X			X				
10	51	X		X	X			X				
11	50		X	X	X				X			
12	70		X				X	X				
13	56		X	X		X			X			
14	70	X		X		X		X				
15	69		X	X		X					X	Death
16	73		X	X	X				X			
17	75		X	X		X						X
18	56	X		X			X	X				
19	40	X		X	X			X				
20	63		X	X	X							X
21	60		X	X	X			X				
22	76		X	X	X			X				
23	66		X	X		X			X			
24	63	X		X			X		X			
25	65		X	X	X							X
26	66		X	X		X					X	Death
27	66		X	X	X			X				
28	58	X					X	X				
29	7	X		X	X			X				
30	63		X	X		X			X			
31	57	X		X	X			X				
32	60		X	X	X			X				
33	65		X	X	X			X				
34	71		X	X	X			X				
35	75	X		X		X		X				
36	63	X		X	X			X				
37	72		X	X		X					X	Death
38	58		X	X		X		X				
39	68		X	X		X			X			
40	56		X	X		X			X			
41	72		X	X	X				X			
42	68		X	X	X				X			
43	65		X	X		X			X			
44	60		X	X		X					X	Death
45	62		X				X			X	Death	
46	70		X	X		X		X				
47	72		X	X		X						X
48	41	X		X	X			X				

1 Intra = Intracapsular
 2 Imp. = Impacted Intracapsular
 3 Loose = Unimpacted Intracapsular
 4 Extra = Extracapsular Impacted & Unimpacted

An analysis of the series of cases shows that the average age of the forty-eight patients was 65 1/3 years. In regard to the range of applicability of this method, it will be seen, that of the forty-eight patients in whom the diagnosis of hip fracture was made only six, or

12.5%, were in such poor condition when seen that no treatment was advised. Five of these died in a few days, the sixth was suffering from an acute gall bladder at the time of injury, which made it necessary to treat the leg with sand bags. She recovered from the gall bladder infection but has an ununited fracture.

The other two patients who died during treatment, death in one case occurred many weeks after injury from decubitus, and in the other diabetic coma was the cause.

The mortality of hip fractures treated and untreated in many statistics is stated to be from 20 to 40%. Were the mortality rate of all cases seen published with the results obtained in the treated cases, we could better judge the value of the methods of treatment especially in the aged.

The method of treating hip fractures with the flexed abducted spica was primarily devised for old, feeble patients, who are poor surgical risks and are poor subjects for bed treatment. In the present series there were forty-three patients over fifty and thirty-five patients over sixty. There were two deaths during treatment and five deaths of the untreated cases, an immediate mortality of about 14.5%, and a mortality in the 42 treated cases of but 5%.

The fact that thirty-four of these patients were women and but fourteen men is an illustration of the effect of the sedentary life led by American women,—in old age they are afflicted more with instability and lack of coordination than men.

The number of intracapsular as compared with the extracapsular fractures in the series deserves explanation as there is still some discussion over this academic and at the same time rather practical question of classification. The classification here used is based upon the anatomical attachment of the capsule. With the exception of case 1, only those in whom the x-ray showed the injury to be outside the line of attachment of the capsule were diagnosed extracapsular. Crushing injuries at the base of the neck were diagnosed intracapsular fractures.

There were twenty-five good results in the series of forty-two treated cases, about 60%; 11 poor results with two deaths during treatment, six untreated and four not heard from. Of the twenty-five good results fourteen were impacted, six loose intracapsular fractures and five extracapsular. The intracapsular fractures deserve mention, as the results are suggestive of the value of impaction as an aid to union in hip fractures. In the aged this type of fracture with much shortening and deformity was reduced. The reduction was accomplished by traction and "moulding;" great care was exercised not to "break up" the fracture.

Of the loose intracapsular fractures occurring in this series six died as an immediate re-

sult of the injury, one was untreated and is still living. Of the treated cases there were six good and six poor results, about 10% lower than the impacted fractures, one was not heard from.

In regard to the application of the cast, it was found that application down to the calf of the leg resulted in an unpleasant edema of the leg and foot. The cast has since been extended down to include the entire leg and foot to the toes. Placing the foot in inversion in the cast seems to have a beneficial effect on the position assumed after treatment.

After reduction strong upward traction and extreme abduction are made beneath the calf, while the cast is applied down to the assistant's hand making the traction. See Figures 1-2. The cast is allowed to "set" before traction is removed. By this means the fragments are held in apposition during the application of the cast and they remain immobilized throughout treatment. Backward displacement or rolling of the trochanter, which Whitman has mentioned in the application of his cast is automatically corrected by the position in which the leg is placed in applying the cast.

Stiff joints and contractions following this method of treatment, as possible complications mentioned by Cotton and Whitman, have occurred in but one case of the forty-two treated cases here reported. In this case the cast was removed by the family physician and no attempt made to extend the leg. It is my practice to have the patients massaged after the removal of the cast until joint function in the leg is normal. I have rarely seen this require more than two weeks. One patient, a man of sixty-one at the time of fracture, had had a severe arthritis for many years. Since recovery from his injury, now nearly nine years, he has been able to get about as well as ever.

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LATERAL SINUS INFECTION: DIAGNOSIS, TREATMENT AND COMPLICATIONS.

By G. L. TOBEY, JR., M.D., BOSTON.

THROUGH constant repetition in medical literature and as a hospital colloquialism, the terms "Sinus Thrombosis" and "Sinus Phlebitis" have come into general use as a definite