

and it seemed to me that there remained barely an eighth of an inch of shortening; I then applied the Scultet apparatus.

In the other two cases I did not have recourse to anæsthesia to make the reduction, and for these reason: one of them, No. 11, is a teamster more than 56 years old, and greatly given to drink; now you know that in such patients muscular resolution is difficult and slow to obtain. It is necessary to give a great deal of chloroform and consequently expose the subjects to the dangers of this agent, dangers which exist especially during the days which follow great traumatic lesions. It is also necessary to pass through a much longer and more intense period of excitation, during which perforation of the skin by the fragments is not impossible. This accident happened to one of my patients in the Hôpital Cochin in 1858. Two of us held the fragments as firmly as possible, but the patient struggled so violently several times that the limb slipped through our hands and a point of the upper fragment pierced the skin. This perforation healed by first intention, thanks to the occlusive dressing immediately applied. But it is none the less true that this possible complication and even the danger of increasing the tearing of the muscles and periosteum during these struggles, necessitates a certain reserve in the use of anæsthesia in cases of this kind, and are even a contra-indication in patients who are rather old and alcoholic.

The other patient, the one with the sub-trochanteric fracture (No. 46), has so much shortening that I could not hope to obtain a permanent diminution of it by means of anæsthesia. The little that I might have obtained would certainly not have lasted, and therefore it was useless to expose the patient to the risks of chloroform.

Let us now examine the second question, that of reduction. How shall these fractures be confined and immobilized, and what precautions shall we have to take during this retention?

For two of the patients, Nos. 5 and 11, the problem is already in great part solved. I have applied the Scultet apparatus, to one of them after having made reduction during anæsthetic sleep, to the other without this preliminary précaution. I took care—after having wrapped the leg in the compresses and bands which form the inside of this apparatus, and after having applied a very long external cushion of chaff which reached from above the crest of the ilium to below the edge of the foot, after having also applied internal and anterior cushions, then the three splints corresponding to these cushions, and after having closed the femoral and tibial portions of the apparatus with the buckled straps—I took care, I say to complete the dressing with a body bandage applied about the pelvis and sewed fast to the outer envelope of the Scultet apparatus, and then placed the patients on the mechanical bed.¹ I shall not use the water-bed unless sores appear on the sacrum and make me fear an eschar.

I have also told the patients not to sit up in bed, to eat while lying down, and to move as little as possible. I shall prescribe in a few days one or two drachms of the phosphate of lime daily.

I shall renew the apparatus every third or fourth day during the

first fortnight, and each time that I do so I shall make fresh attempts to overcome the shortening. I do not hope to diminish it very much by these repeated reductions, but I shall at least be able to oppose the increase which tends to take place during the first two or three weeks.

After the twentieth day I shall renew the apparatus only every eighth or tenth day; I shall only have to tighten the outer straps when I find them relaxed.

On the sixtieth day I shall see if any mobility remains, by making with precaution the manœuvres which you saw me employ the first day to detect this sign. If I no longer find mobility I shall leave the limb uncovered and tell the patient to make a few movements of his toes, foot, and knee. I shall myself communicate some from time to time to combat rigidity of the articulations, especially of the knee. If I still find mobility, I shall reapply the apparatus and leave it, renewing it from time to time, until consolidation is obtained.

At what period will I allow the patients to get out of bed and walk with crutches? I shall wait at least until the eightieth day, and probably until the ninetieth. For one of the things which I fear, and which should be most feared after fracture of the thigh, is the breaking of the callus by a fall, even a very simple one, while walking or standing. I have seen these iterative fractures on the seventieth and seventy-fifth days, in patients who had left their bed too soon, in opposition to my advice, and then it required three months more to get consolidation.

In general, I let the patients get up only after I have demonstrated by several trials the absence of abnormal mobility and the patient's ability to raise the heel five or six inches from the bed without bending the knee.

You will perhaps ask why I have given the preference to the Scultet bandage, with the limb extended; why I did not choose, as has been recommended, and as you have seen me do, the same apparatus with the limb bent upon a double inclined plane; why I do not speak of an immovable bandage, and why I do not use continuous extension for all three of our patients, as I am going to do for the last one of them.

These are my answers:—

1st. As for the Scultet apparatus with the limb in semi-flexion, I recognize in it one advantage, which is that this position of the knee seems to cause a less rebellious arthritis and less consecutive rigidity.

Nevertheless the fact is not yet established by sufficiently numerous observations, to serve as a basis of treatment; and, on the other side, I have often seen this position of semi-flexion cause intolerable pain in the calf of the leg, so that the inclined plane had to be removed and the limb placed in extension. Indeed, in two of my patients, this compression of the calf of the leg was followed by obliteration of the popliteal vein and painful œdema of the leg.

I know that this obnoxious compression can be avoided by using, instead of the wooden inclined plane, one made with bags of chaff, as Dupuytren and Sanson did. But I saw that these bags yielded readily, and that to replace them and re-establish the semi-flexion the limb

¹ See page 83.

had to be moved three or four times every day, which is a disadvantage. And as finally consecutive rigidity is not completely prevented by semi-flexion, and as that which follows extension disappears, I do not see any real utility in adopting semi-flexion as an absolute rule.

2d. I do not intend to employ an immovable apparatus, because it would no more prevent shortening than will the one which we have chosen, and because it would perhaps permit the reproduction of angular displacement. For sixty to eighty days of immobility are necessary. If the limb was enveloped in a plaster, silicated, or dextrinated bandage, the application would be made by the fifteenth or twentieth day; for, if applied later, it would be of no use. It would have to remain in place for from forty to fifty days. Now during this time the limb would diminish in size, a gap would result, and the fragments, being less well supported, might undergo longitudinal displacement. I much prefer the movable bandage, which I tighten when relaxed, and which I renew entirely from time to time. I thus support the fracture much better, and avoid more surely very vicious consolidations.

3d. Why not an apparatus to make continuous extension? Theoretically, this mode of treatment is reduction, for if we cannot, with our hands and in a single attempt, overcome the resistance of the muscles which produce the shortening, it is logical to hope that this resistance can be conquered by a long-continued mechanical traction. That is the thought which guided Brunninghausen, Desault, Boyer, Baumers, F. Martin, and all the surgeons who, before and since their time, have invented apparatuses for continuous extension for the treatment of fractures of the femur.

Notice this well, gentlemen:—

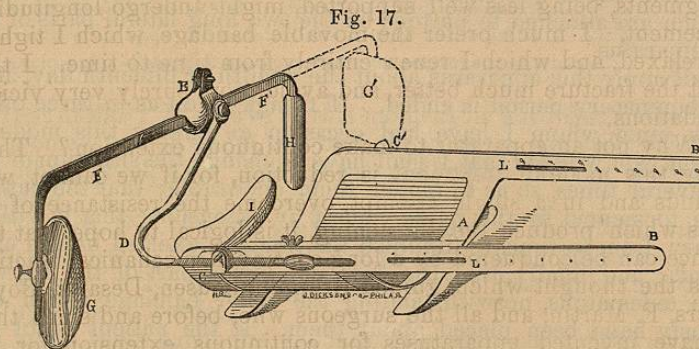
The idea of continuous extension is very rational; many apparatuses inspired by this idea have been invented. None of them thus far have been able to take definitive rank in practice. From time to time a new one is invented because the inconveniences and insufficiency of the others are recognized.

Whence comes this difficulty of making the practice accord with the theory? It comes from this, that to overcome the very energetic muscular resistance against which they have to contend, these apparatuses for continuous extension have, on the one hand, to permanently exert strong tractions which are in themselves painful, and, on the other hand, to apply the extension and counter-extension at certain parts of the limb where the pressure causes pain, and sometimes eschars. That which has prevented, then, the use of these apparatuses from becoming general is found first in these two results: pain and eschars.

There is also a third reason; in many cases, after having subjected the patients to these inconveniences, the shortening has persisted. Those who have not given close attention, and who have not measured, may have been deceived by a lowering of the pelvis which hid the real shortness; but those who measured have almost always found a shortening of from one to one and a half inches, and have been obliged to recognize that by these sufferings, supported for several weeks, they have barely gained from one-quarter to three-quarters of an inch.

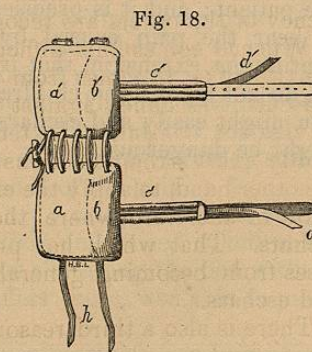
There is also a fourth reason. When the patients are young, the shortening, if not more than one and a half inches, does not make them limp permanently. Why then expose them to the pains of continuous extension? When they are old the shortening will certainly make them limp, but they will also be much less able to bear extension; they will have eschars more easily, and, in consequence, incur greater danger. Is it not better, then, to be satisfied with simple retention, which will leave a little more shortening, but will give more tranquility to the patient and surgeon?

Such are the reasons, gentlemen, which have prevented, and will long prevent, the use of apparatuses for continuous extension from becoming general in practice.



Hennequin's Apparatus. D, bent rod which can be placed on either side of the trough A; E, clasp, through which slide two rods, one of which bears the iliac pad G, the other, the pubic pad H; I, ischiatic pad in the form of a crescent.

But these reasons are not sufficient to cause us to reject them absolutely. I understand why they should try continuous extension in cases where the shortening is very great; but it should be done only on the condition of watching the apparatus attentively, so as to avoid eschars and to diminish as much as possible the pain caused by the tractions. These are the ideas which have guided me in the treatment of our last patient. I might have used Baumer's method, in which counter-extension is made upon the pelvis at the genito-crural fold, or that which is known as the American splint, in which the axilla on the side corresponding to the fracture is used for this purpose; but I preferred the apparatus now more generally used in the Paris hospitals (Fig. 17), which was invented by Dr. Hennequin.¹



Hennequin's Apparatus. aa, band to surround the leg, thickly padded at bb, which corresponds to the condyles of the femur; cc, elastic bands ending in straps perforated with holes; dd, ribbons graduated to show in pounds the amount of traction.

¹ Hennequin, Quelques Considerations sur l'Extension continue et les Douleurs dans la Coxalgie (Archives Générales de Médecine, Dec. 1868, à Février, 1869).

I shall not give you a minute description; it is sufficient to show it to you, and to recall in a few words its principal points and advantages. It consists of a trough in which the thigh rests, allowing the knee to be flexed, the leg being outside the bed and the foot upon a chair.

Counter-extension is made by means of pressure exerted—1st, upon the ischium by a curved pad (I, Fig. 17), attached to the upper part of the trough; 2d, upon the outer iliac fossa by another pad, G; 3d, upon the horizontal ramus of the pubis by another pad, H. The two latter are attached to the rest of the apparatus by two rods sliding through a hinged clasp, E. Counter-extension is made by means of the bracelet represented in Figure 18, which surrounds the thigh, and from which extend two elastic bands, *c d*, *c' d'*, a sort of artificial muscle, which are attached to buttons on the two long lateral parts of the main apparatus.

I shall apply this apparatus about the twelfth or fifteenth day, after the inflammatory period is ended. If things go on as in three other patients upon whom I have had occasion to employ this mode of treatment, you will see that I shall have to change the situation of the pads several times, so as to render them endurable; that the patient will be tormented by the pains caused by extension; that it will be necessary, from time to time, to diminish the traction exerted by the elastic bands; and finally, that the foot and lower part of the leg will become œdematous, notwithstanding the roller bandage which will previously have been placed about them. If the patient is not too sensitive, and if he bears the pain bravely, we shall perhaps succeed in curing him without shortening, or with a shortening of about an inch. But if the pain is intolerable, and if, to diminish it, we are obliged too often to loosen the elastic bands, the result will be less fortunate, and there will remain a shortening of two inches or more. Everything here depends upon the degree of sensibility and energy of the patient; and it is precisely because we find only few who are able to bear the pain caused by this and by every other apparatus for continuous extension, that it cannot be adopted in all cases. Above all, do not try it upon children, women, or old people; for to the pain you might easily add eschars, which would increase the suffering and might be dangerous.

LECTURE XXI.

FRACTURES OF THE NECK OF THE FEMUR.

Two fractures of the neck of the femur in old women—Difficulty of determining upon what point the fall occurred—Functional and physical symptoms—Impossibility and uselessness of the diagnosis between intra- and extra-capsular fractures—Astley Cooper's error as to the influence of age—Obscurity of the authors upon the differential signs—Be satisfied with presumptions upon the seat of the fracture as upon the penetration—Simple treatment in all cases—Indication to avoid pain—Rejection of apparatuses for continuous extension.

GENTLEMEN: We have at this moment in ward Ste. Catherine two old women, one of whom was brought to us the day before yesterday, the other a week ago. Both of them fell while walking, without great violence.

The first (No. 6), 69 years old, slipped in her room, and, after several efforts to keep her balance, fell upon the right side.

The second (No. 20), 71 years old, made a misstep in the street and fell upon her left side.

I asked them particularly what part of their body received the force of the fall; they answered that it was the side, and indicated with the hand, the one more especially the hip, the other the hip and buttocks. But both showed a certain hesitation in it, and said they did not know very well, but that they thought they fell in such or such a way.

However that may be, neither was able to get up and walk, and they were brought here upon stretchers.

On examining them we find in both the following symptoms:—

1st. *Functional Symptoms*.—Both suffer when they try to move in bed. If the hips are raised for the purpose of passing a bed-pan, they cry out; when not moved they suffer little. The one who has been here for a week suffered during the first two nights, but scarcely at all now. The one who was admitted the day before yesterday suffers a great deal, and had a bad night on account of the pain.

I told them to raise the foot from the bed; neither one was able to do so. No. 6 took her thigh in both hands and raised it, but at the same time she bent her knee, and her foot slid along the bed without being raised above it. No. 20, who suffers more, was able to make no movement.

Both of them have an imperfectly circumscribed swelling of the upper part of the thigh; the one who was admitted most recently has an extensive ecchymosis in the trochanteric region.

2d. *Physical Symptoms*.—I called your attention first to the attitude of the patients. They were lying upon the back, and a little on the painful side, and begged earnestly not to have the position changed. The injured limb was rotated outwards, so that the outer edge of the