THE TREATMENT OF FRACTURE OF THE MANDIBLE

By WILLIAM GUY, F.R.C.S., L.D.S.Ed.

Lucas Championnière in the Introduction to his classic, *Traitement des Fractures par le Massage*, says:—"La thérapeutic des fractures, dans la chirurgie moderne est à peu près exclusivement constituée par les soins de l'immobilisation." This observation applies with especial force to the generally practised methods of treatment of fracture of the mandible—indeed I think there is no fracture on which there has descended with greater malignity what my friend Mr Dowden calls "the Curse of Immobilisation." That immobilisation of these fractures is the authoritative teaching might be shown by many quotations from text-books and monographs; let one, however, suffice. Blair in *Surgery of the Mouth and Jaws*, 1913, states: "Wiring the lower to upper jaw, either by the teeth, or by a wire passed around the lower jaw and fastened to the upper teeth, and, when necessary, wiring the bones directly, are the only plans of treatment that we now resort to in the treatment of fractures of the lower jaw." The war afforded opportunities to surgeons and dentists for the treatment of this particular injury in numbers unprecedented. Men saw and treated in a single fortnight more cases than in civil practice they could have hoped to see in a lifetime. Extraordinary ingenuity was displayed in the devising of apparatus of immobilisation. Controversy raged around the question of the relative merits of immobilisation of the jaws in the "closed" or the "open bite" position. Far be it from me to belittle the results that were obtained, or to throw a damper on the satisfaction with which they were viewed; the object of this paper is to show that I stand by Lucas Championnière, that I accept his principles and practice of which he himself says: "Les principes que j'y expose et les pratiques que je conseille sont contraires presque partout aux idées très généralement acceptées et aux enseignements de la chirurgie régulière," and to maintain that in the vast majority of cases of fractured mandible, immobilisation is not only not necessary, but inadvisable, or even prejudicial to a successful issue.

The aim of treatment should be re-establishment of function.
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at the earliest possible moment. It is of importance that the fracture should at the termination of treatment be united, it is of still greater importance that the patient should have a lower jaw which is functional, which, in short, he can use. Immobilisation in many instances defeats the attainment of this result. I have seen too many cases in which by immobilisation union in excellent position and perfect occlusion of the teeth had been obtained, but the patient could only separate the front teeth about a quarter of an inch, the temporo-mandibular joint merely permitting an extremely limited range of movement while owing to muscular atrophy and stiffness from long disuse, masticatory power was practically non-existent. Such cases require a long course of gradual opening of the bite, re-education of muscles, massage and electrical stimulation in order partially to restore the lost function. It will be argued that immobilisation is necessary to prevent displacement of the fragments by muscular action. Mr Dowden says that to ignore the action of muscles as a distorting agent is regarded by surgeons as a horrible heresy. If it be so, I am another horrible heretic, for I prefer to believe that the main thing is to encourage and assist the patient to correct displacement. In this the muscles directed by the will are the effective factors, and the correct position once obtained is, provided movement has been permitted from the first, generally maintained without assistance. I do not wish it to be inferred that no treatment whatever apart from mobilisation is required, the fragments must be coapted, and coaptation in most instances maintained by mechanical support of some kind, i.e., by an intra-oral frame or splint. The questions arise, what are the conditions calling for such a splint and what is the best kind of splint to use? Fractures of the ascending ramus require no splint, the bone, embedded in the muscular mass of masseter and pterygoids, can dispense with extraneous retention. Fractures of the condyloid process or coronoid process are likewise independent of splints. Fractures of the body of the bone remain. With a fracture of the body on one side, the major fragment swings to the injured side, the minor fragment is tilted inwards and drawn upwards. In bilateral fracture the central fragment drops downwards and backwards. For fractures of the body of the mandible the treatment I advocate is the employment of a single piece intra-oral splint with an aluminium chin-piece or sling externally, to afford comfortable rest and support. The patient must be
encouraged to use the jaw, and instructed that it is his business, or in modern parlance that it is "up to him" so to educate his muscles as to secure occlusion in the correct position. So far I shall have the assent of many of my colleagues, but I fear they will part company when I say that the intra-oral splint should not be fixed to the teeth. For example, Martinier and Lemerle state that "there is one sine qua non of success, the absolute fixation of the splint." It must, however, be apparent that the absolute fixation of the splint does immobilise the fragments absolutely and so prevents the very slight degree of movement which I believe to be provocative of activity in the reparation process. The Hammond wire splint is described in all the text-books, it is unhygienic, not easy to adapt or to fix; personally I have no use for it, nor have I for the Kingsley, Gunning, or Hayward splints, or in the treatment of fracture for any form of fixed interdental splint.

The splint now in common use is a metal one-piece splint either struck or cast, fitting over the teeth either completely or allowing the occlusal surfaces to come through, and cemented into place with dental cement. The splint I use is a loosely-fitting frame surrounding but not enveloping the teeth, and is cast in silver. It merely lies in the mouth and can be removed in a moment for cleaning, or for examination and treatment of the mouth or teeth. Its function is to prevent vicious movement of the fragments. Fig. 1 shows examples of this appliance. Figs. 2 and 3 show it in position on a model of the lower jaw and teeth. It has three great advantages, it is clean, comfortable, and efficient. The fixed trough splint may share two of these advantages, but I have removed a good many and never found one yet that did not stink.

The chin-piece or sling is made of aluminium and affords support. Gentle upward pressure may be advisable in the earlier stages; this is effected by providing sliding catches at the sides joined by a rubber band running between them on the outer and lower side of the chin-piece. Tapes attached to the catches are tied over the vertex, and graduated elastic pressure is thus obtained. This chin-piece is particularly useful in bilateral fractures, in these its use is continued till union occurs.

To obtain the cast on which the frame or "atelle" is moulded, it is necessary to get an accurate impression of the lower jaw and teeth with the fragments in good position.
Fig. 1. — "Frame" or "atelle" splints.

Fig. 2. — "Frame" in position.

Fig. 3. — "Frame" in position.
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The text-book method is to take an impression without attempting to correct the position, to saw through the plaster model, and to reduce the displacement on the model by placing the parts in exact articulation with a model of the upper jaw. I find it a comparatively easy and more satisfactory procedure to take an impression of the lower jaw with the fragments in the correct position. An assistant maintains them in position by means of ligatures thrown round the teeth, aided by digital pressure and support. This method is identical with that recently described by the French writers Roy and Vilain, but it has been practised and taught by me for over twenty years. On the model from this impression the "atelle" is modelled in wax, taking care to have a loose fit, and is then cast in silver by the vacuum-casting process.

Massage is the most valuable supplementary treatment we have in dealing with these injuries.

It may be said in criticism of the methods I advocate, that admitting their suitability for such fractures as are commonly met with in civil practice, they will not be applicable to the severe type of injury caused by gunshot wound and accompanied by extensive external wounds, fracture of teeth, and destruction both of bone and soft parts. I believe, however, with my mentor Lucas Championnière, that the dictum that movement is necessary for the successful treatment of fractures is even more applicable to compound than to simple fractures, and acting on these principles I have treated over four hundred fractures of the mandible caused by gunshot wound, of every degree of severity. In the result I am confirmed in my conviction that "Le mouvement c'est la vie."

Per contra, I believe that long-continued immobilisation results in stiffness and limitation of movement of the temporomandibular joint, causes atrophy of muscles, is a condition favourable to the continuance of sepsis and the extension thereof, so also to necrosis of bone and infiltration of soft parts, while at the same time it is unfavourable to the formation of callus.