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## ORIGINAL ARTICLES.

### A UNIVERSAL MENTO-DENTAL SPLINT, WITH REPORT OF CASE.

Read in the Section of Dental and Oral Surgery, at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

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Before showing the splint and reporting the case in question, it may be well to review in some degree splints and bandages for broken lower jaws, and in particular mento-dental splints.

Heath divides appliances for the jaw into two classes, external and internal to the mouth, though he says "it may be necessary to combine the two methods in a few cases."

The simplest and most effective form of external apparatus, and by far the best in a very large majority of cases, is the four-tailed bandage, two of the tails being carried over and tied on top of the head, the other two carried back and tied around the nape of the neck, the part covering the chin oft-times

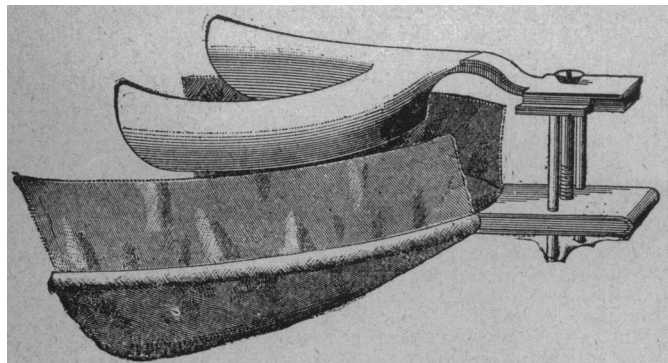


Fig. 1.

being reinforced by pasteboard or sheets of gutta-percha. This method with its variations is no doubt familiar to you all, and when the fracture is simple with no displacement is undoubtedly the best, since it brings the lower teeth in perfect occlusion with their antagonists and holds them in their proper places, as well as puts the fractured ends of the bone in direct apposition, so that when the fracture is healed the jaw is in every way in its proper and normal condition, both for use and appearance. The great objection to this form of apparatus, also in inter dental splints, is that the patient must be fed on liquid foods. Gross says, "I have known great emaciation to arise from inability of the patient to take appropriate nourishment during the long confinement of the parts." All inter-dental splints, also wires and ligatures, are usually accompanied by external bandages to hold the lower jaw against the splint and against the upper teeth, so that the ina-

bility to take proper nourishment enters largely into the objection to these forms. Dr. E. H. Angle's method is a most excellent one. It consists of buttons or short pipes soldered to bands which are fitted to the appropriate teeth and these bands are tied, wired, or fastened together with rods thrust through the short pipes on the bands and held at one end with a hook on the rod and a nut screwed on to the other end.

This method has the very great objection of complication, for one is certainly safe in saying that hardly any surgeon and very few dentists are prepared to or can fit a band to a tooth firmly enough to withstand much strain, even after long experience. The writer has used Angle's apparatus in a number of cases of regulating, and to fit them firmly to the



Fig. 2.

teeth in the case of a fractured and inflamed jaw would certainly be difficult.

Mento-dental splints or appliances made to grasp the lower jaw, are not new. They are made with one part fitting the crowns of the teeth, the other part the chin and lower border of the jaw.

In 1799 Rutenich, a German surgeon, used such an appliance. Bush in 1822, Houzelot in 1826, Lonsdale in 1867, Hill in 1866, and Moon at a later date. These all used mento-dental splints and all with reasonably good results. These splints have the great advantage of allowing the patient to take nourishment of any kind demanded. They also have the disadvantage of becoming foul after being worn awhile.

Heath remarks: "The great difficulty in using all forms of rigid splints to the jaw is the tendency of the support for the chin to produce abscess and

ulceration by the pressure upon the sharp border of the bone." These splints do not seem practicable used back of the second molar, but certainly work well with fractures anterior to that point.

Our own experience coincides with what Heath says, for in the case to be reported abscesses made their appearance and the splint was obliged to be removed much earlier than desired on that account. The case resulted reasonably well however, as the model will show, but we have a form of a chin support to present which is designed to do away with the objection spoken of, by using a canvas instead

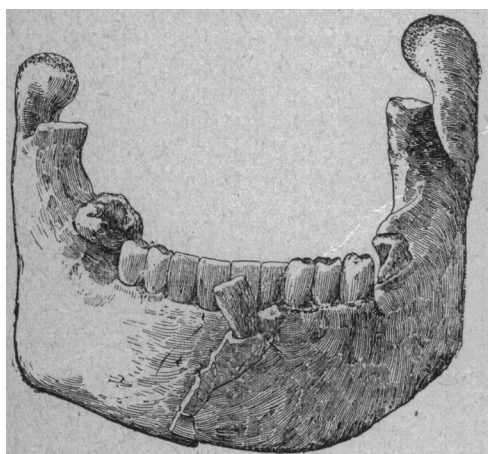


Fig. 3.

of a metal support for the chin. (See Figs. 1 and 2.)

The case we have to report is as follows:

Mr. B. H., age 36, on the 23d of last December was attacked by three highwaymen for purposes of robbery, but being a good fighter he laid out the three robbers and proceeded to his home. After having somewhat subsided from the excitement of the melee he felt a pain in the lower jaw. The next morning he proceeded to a surgeon and found that his jaw was fractured, one of the men having struck him a heavy blow on the chin with his fist. There being no displacement the jaw was dressed in the usual way with a four-tailed bandage and in three weeks he was back to his work again. Mr. H. is a wood-worker in a carriage factory.

On the 18th of January, twenty-six days after the first accident and three days after he had gone to work, Mr. H. with five other workmen was called to test a

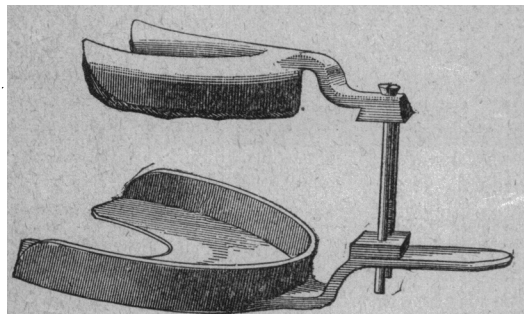


Fig. 4.

new fire ladder, and being the first to mount he was at the top, about thirty feet from the ground, when the ladder broke, and falling, he struck the pavement with terrific force, breaking both arms below the elbow and crushing the jaw in a frightful manner, breaking it through the old fracture. The nearest surgeon was called, who dressed the wounds and sent the men to their respective homes. Mr. H.'s jaw was dressed in the usual manner with a four-tailed bandage. Ten days after, finding the jaw was not doing well and that the fracture had not been reduced, the writer was sent for by the attending surgeons to see what could be done with some different kind of apparatus. After examination it was found that the jaws were so closely set together that it seemed impracticable to take an impression for the

purpose of making a plaster model with the idea of breaking and resetting it in normal position for the purpose of making an inter-dental splint, as suggested by Heath and others. So we conceived the idea of making a mento-dental splint of two block-tin impression trays such as every dentist has at hand. This splint was worn for five weeks but had to be removed on account of two abscesses forming, one on either side of the chin, where the chin support pressed hardest on the soft tissues. The fracture was comminuted and compounded on the inside under the left bicuspsids, the point of the right half and some of the bone being through the flesh at that place. The left lateral and the right alveolar process, which had surrounded it, was taken away with the fingers from the front side, and afterwards some smaller pieces of bone were removed from the wound in the same

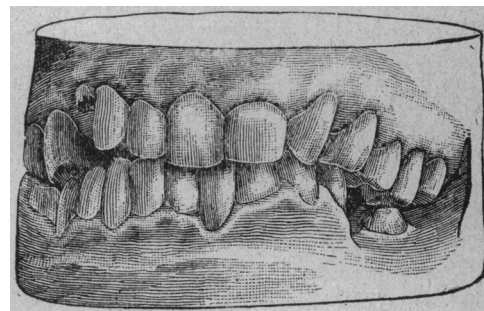


Fig. 5.

place. There was about one quarter of an inch of the bone lost and the left central now stands adjoining the left cuspid. (See Fig. 3.) The remaining incisors were all loose.

Twelve days after the accident, the splint being ready, such plastic adhesions as had formed were broken up, the left lateral and loose pieces of bone removed as stated, the two halves of the bone were reduced and ligated as nearly to their normal position as possible, and while being held firmly in this position by an assistant the impression tray used on top of the lower teeth was filled with plaster of Paris, which had been mixed with a one grain to the ounce solution of bichloride of mercury (for antiseptic purposes), the splint (see Fig. 4) was applied and the parts held firmly in this position with the hands until the plaster had time to set, the screw of the splint being tightened at the same time, and tightened from time to time as necessary.

The fracture was obliquely across the chin from the neck of the left cuspid across the symphysis to a point below the right cuspid, as shown in the plaster model. The result is to be seen in another model made after the fracture had healed. (See Fig. 5.)

[Fig. 1 represents the ideal universal splint, the chin-support being made of a fork of stiff wire, across which is stretched heavy canvas, the margin of canvas being allowed to stand up long enough to pin or sew the head and neck bandages to, thereby gaining the advantage of a four-tailed bandage in addition to the mento-dental feature of the splint. In the early stages of the case the tails can be kept tied, excepting at the times of feeding, or left off altogether, as the case may require. Additional trays of different sizes may be made to suit the case; they are inserted into the splint by removing the screw, and withdrawing from the slot the one in place and inserting the one desired. The size and shape are further modified by bending the cup (which is made of block tin) to any shape desired. The part of the splint coming down and fitting on the crowns of the lower teeth is designed to be filled (when applied) with plaster of Paris, softened gutta-percha, or other material suitable for holding the teeth firmly in position. This splint is designed to be made and kept on sale with other surgical supplies, one outfit being sufficient for all cases where it may in any way be demanded.]

Fig. 2 represents the splint in position. The splint represented in Fig. 1 would not need the cotton packing, and can have the four tails attached or detached at pleasure.

Fig. 3 represents a plaster model of the jaw-bone, as near like the jaw when found as could be constructed; the projecting left lateral incisor and the amount of bone, as represented by the line, were lost.

Fig. 4 represents the splint used in the case, which is constructed out of the ordinary block-tin impression trays, the fittings being made of brass plates and wire soldered together with soft solder; the screw is an ordinary stove or carriage bolt, made to cut its own thread in the soft solder

which has run in the hole in the lower part of the apparatus, and is to be tightened or loosened with an ordinary screw-driver. The chin-support was packed with cotton wool.

Fig. 5 represents the case after recovery.]

June 1, 1892.

#### Discussion.

Dr. John S. Marshall said he was interested in the splint, and that while it served its purpose admirably, he thought the better way to treat fractures of the inferior maxilla was to wire the parts firmly together with a silver wire, as the mouth is so much easier to keep clean than when a splint is worn. In such cases he dissects down the tissues till the edges of the bone are reached, the tissues and the periosteum being laid back. A drill is then passed through near the end of the bone, care being taken to avoid the roots of the teeth and the inferior dental canal. A silver wire is then passed through the holes in the ends of the bone, and the parts brought together. Two or more such sutures are made, and secured until the fractured parts are immovable. He has treated many such cases in this way without any bandages. No after-treatment is required except frequent washings with an antiseptic mouth-wash, for which he prefers Thiersch's solution, as follows:

Boracic acid, 12 parts;  
Salicylic acid, 4 parts;  
Water, 1000 parts.

This is a good antiseptic: is not dangerous, nor unpleasant to the taste, only a little bitter.

He related the cases reported on pages 575-6 of the *Dental Cosmos* for 1892, and in reply to a question said it was usually necessary to leave the wires in place from four to eight weeks, the time depending upon circumstances. In nearly all cases suppuration will take place and retard the knitting of the bone.

Dr. Curtis said the results of the case reported by Dr. Fletcher are exceptionally good, and the splint is very well adapted to the class of injuries it was designed for. He thought in hospital cases the plaster bandage was perhaps as good as anything,—that is, where there are teeth in both sets; but before it was applied several layers of cotton should be placed under the chin whenever the bandage will come in contact, to lessen the liability of abscesses forming.

Dr. Marshall said that the evidence of all surgeons to whom he had talked upon the subject was that a splint of this character was always a failure where there was any displacement, and that the system of wiring was always used.

Dr. Allport said that he agreed with Dr. Marshall that wiring was better than any splint. He believed that he himself was the first man who used wire for this purpose. It was about thirty years ago, and he got good results. He related the case of a lady who fell from a step and broke each jaw in four pieces. He wired all the pieces in place, and the bones united perfectly, and the result was in every way satisfactory. He thought that oral surgeons were better able to handle such cases than the general surgeon.

Dr. Barrett reported a case of a boy who was run over by a heavy wagon in such a way as to crumble the lower jaw frightfully. He was brought to the city and put in the hands of a competent and skillful surgeon, who wired the pieces together by wire around the teeth. When the mouth was open the parts were kept in proper position, but when shut the jaw went away around to one side. Dr. Barrett, being called in consultation, found four physicians there, all of whom confessed that the injury was beyond their skill to repair, hence they had called him in as a specialist in these things. The boy had been under an anesthetic for most of the time for four hours.

Reasoning by exclusion, as there was no crepitation and no fixation, he concluded that there was no luxation, and no complete fractures that were not securely wired, and that there was only one possible cause for the condition: an incomplete or "green stick" fracture across the angle of the ramus. With the muscles relaxed the jaws fell directly down, but when the boy attempted to close his mouth the temporal and internal pterygoid, with some of the fibres of the masseter, not being counteracted on the other side, drew the jaw to one side, it bending or yielding at the point of the incomplete fracture.

The boy was taken to Dr. Barrett's office, and gutta-percha impressions taken of both jaws. The impressions were trimmed to the proper shape, and a notch cut in front

for feeding through, and the boy having been again anesthetized, the occluding surfaces of the gutta-percha impressions that were to serve as splints were warmed until they were adhesive, and placed upon the teeth; then by main force the jaw was carried to its proper place, the two gutta-percha splints stuck together, and the whole was fastened with a two-tailed bandage. The operation was a perfect success.

Dr. Fletcher said that though wiring was undoubtedly to be preferred in many cases, it was not admissible in such as he described, because in his case at least a quarter of an inch of the bone was lost by comminution, and to wire the bone together would make proper occlusion of the teeth impossible.

#### DISEASES OF THE GUMS.

Read in the Section of Oral and Dental Surgery, at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

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It is not my purpose to try and cover the whole field of pathological conditions that would naturally come under the above heading, but simply take up such parts as are more common in our general work.

So far as the anatomy, histology and normal conditions of the gums are concerned, I will pass over that division, and not consume time by repeating that which we must know, in order to fully appreciate any abnormal conditions or changes that may take place in the gums.

When you deal with pathological conditions, let them exist wherever they may, in our body, we at once encounter the problems of growth and development, nutrition and assimilation. So here, when we find diseased conditions of the gums, we know that the laws that govern the process of growth and development, and the functions of nutrition and assimilation, have been changed to a greater or less extent, with the corresponding resultant of active or passive congestion, hypertrophied or atrophied conditions or increased cell growth of the tissues involved.

When we take up active or passive congestions or the acute and chronic inflammations of the gums we consider the type of cases that come to our notice more often, and cause more trouble to our patients, than is made manifest by the hypertrophied, atrophied and cell growth conditions combined. Under the section of acute inflammation of the gums, we have to contend with the acute or inflammatory oedema, marked by its rapidity of development, severe pain, tumefaction and great tension of the tissues, due to some chemical or traumatic lesion, and closely connected to this pathological condition, we do encounter gangrene of the mouth (or noma), which is less rapid in its development and attended with a less degree of pain, but far more destructive in its results, and much more obstinate in yielding to treatment. Under this division we may also include the acute catarrhal, herpetic and croupous inflammations.

Under division second, or passive congestions where the circulation is slowed in its course, affording an opportunity for the red blood corpuscles to accumulate in the arteries, and the white blood corpuscles to find their way into the veins, whose anatomical structure, viz.: their thin walls, affords an easy escape of the white blood corpuscles, by their amoeboid movements, into the surrounding structures, and at the same time with the passage of the white blood corpuscles, or leucocytes, there is also