ON THE
OCCASIONAL ORGANIC UNION
OF
CONTIGUOUS TEETH.

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THE following Paper contains a few observations on a peculiar and rare abnormal condition of the human teeth, which consists in the *organic union of contiguous individuals*, a departure from the natural condition and arrangement, which, though extremely uncommon, is nevertheless of much importance, where it does occur, to the dental surgeon, and is no less interesting to the physiologist, to whom it suggests questions as to its mode of production, and matter of some significance as to the development and source of the tissues of the teeth.

The fact that a union of neighbouring teeth does really occasionally occur is not now, I believe, ever called in question; and though for some time after its first publication by Mr. Fox it was disputed and denied, it is treated of in all the more recent practical works on diseases of the teeth.

Although, however, the circumstance itself is admitted, I am not aware that any anatomist has yet described the manner of junction of the teeth, or has demonstrated microscopically by which of the tissues the union is effected.

And even those who have done much in questions of microscopical tooth structure, have merely suggested that in these cases the union has probably been produced by the bone, or cementum of the fang, an opinion which is not confirmed by the specimens examined by myself.

It is my object, therefore, in the present communication, not only to enumerate additional instances of dental union, but to demonstrate the nature of that union, and suggest its probable mode of production.

The earliest notice of this peculiar condition with which I am acquainted was given by Mr. Fox in 1803. He observes, "Sometimes in the formation of the teeth two pulps unite, and upon their surfaces appear as two distinct teeth; but upon attempting to remove one it is discovered to be united to the next."

It is this statement that was called in question.

The next observation upon the subject was made by my relative, Mr. Bell, in 1829, who, in his work on the teeth, remarks: "The intimate and inseparable connection of two teeth by means of a true bony union¹ of their roots and sides, though not a frequent occurrence, is too well established by facts to admit of a moment's doubt. I have met with six instances of it in my own practice."

I am aware of two other recorded examples of this malformation; one given by Mr. Tomes in his work on the Teeth, as having occurred in the practice of Mr. Rogers, and another published in the 'American Journal of Dental Surgery.' Added to these are the two specimens, drawings of which accompany this Paper.

It is not a little remarkable that, considering how few cases are on record, almost all classes of teeth appear to have been subject to this affection, a circumstance which shows that there is nothing in the form or development of any

¹ It is evident that the term "*bony union*," used by Mr. Bell, was not intended to convey the idea that the union was effected by *crusta petrosa*, or true bone. At the time Mr. Bell wrote, what we now know as *dentine* was considered *dense bone*.

particular teeth, or any region of the mouth, more calculated to produce it than any other.

Of the three cases that occurred to Mr. Fox, one consisted in a union of the central incisors of the lower jaw by their fangs and the sides of their necks and crowns; in another the second and third molars of the upper jaw were united by their fangs; and in the third the fangs of the second lower bicuspid and first molar were completely fused together. These are still to be seen in the Museum of Guy's Hospital.

In the six examples which occurred to Mr. Bell, three consisted in the lateral union of the temporary superior central incisors. The other three are undescribed; but I am informed by Mr. Bell, that they were in one case the permanent superior central incisors; in another the second molar and dens sapientiæ of the upper jaw; and in the third the permanent inferior central incisors. The latter he has since met with more than once.

The example which occurred to Mr. Rogers exhibited union of the fangs of the second and third molars of the upper jaw.

In the American case, before referred to, the union existed between the lower bicuspid on one side.

The specimens, the drawings of which accompany this Paper, display the connection of other teeth. In the one case the union is between a lateral incisor and a cuspidatus; in the other between a dens sapientiæ and a supernumerary tooth.

Thus, in these few recorded examples, we see that individual teeth of each kind have been the subjects of this peculiarity—teeth of the upper and of the lower jaw; the temporary and the permanent teeth; regular and supernumerary teeth; molares, bicuspidæ, cuspidati, and incisores. Considering how few instances have been reported, this diversity is quite remarkable.

I will now call the attention of the Society to a more precise description of my own specimens.

The first that I have to describe consisted in a united cuspidatus and lateral incisor. The teeth were completely

united by a very broad union. When viewed superficially the crowns of the teeth appeared distinct, and the lateral incisor slightly in advance of the cuspidatus; and the division on the surface which separated them down to the necks was so marked, as to render it probable that a casual observer, or careless operator, would be unaware of their junction. Below the necks the fangs had become completely fused together; and though the junction of the roots at the upper half was indicated by a groove, the rest of them was so completely fused together as to obliterate all indication of a double origin. (See fig. 1, *a*.)

Upon making sections of these teeth, I had an opportunity of seeing what has, I believe, never been seen or described before,—the mode of union, and the nature of the uniting medium between the individual teeth.

A section through the crowns of the teeth, made transversely, midway between the summit and the neck, exhibited a form of the figure 8; and it showed clearly to the naked eye a mass of dentine surrounded by enamel, and interrupted only by a small pulp cavity in each of the teeth. Between these pulp cavities, where the union existed, there was no break of surface, and nothing in the aspect of the dentine to indicate that the teeth were distinct individuals. The enamel did not appear to pass between them. (See fig. 1, *b*.)

The question was settled by microscopical scrutiny.

A thin section of these teeth displays within the enamel a mass of dentine, consisting of tubes radiating from each pulp cavity, and passing across the union without interruption. Near the edges of the teeth this continuity of tissue is most distinctly seen; the tubes from one pulp can be followed across the line of junction, and are seen to end upon the inner surface of the enamel of the opposite tooth.

In the centre, however, between the teeth, the section divides the tubes in an oblique direction, as they are not on the same plane with it. They are thus seen more or less cut across, and cannot be traced in lines; but there is clearly no interruption of tissue: it presents exactly the same appearance as any other mass of dentine viewed in

oblique section. This will be better understood by reference to the accompanying drawing. (See fig. 2.)

There is, however, one point which is curious and interesting; it is, that at the margin of the teeth, where they come in contact,—at the extremities of the line of union,—there are two small mammillary projections, one on each side, occupying the interval left by the curving inwards of the outline of the teeth. These appearances at once suggest the idea that, when in a soft and plastic condition, the pulps were firmly pressed together within their sac, and that where they met they were pressed out, as it were, into these little eminences.

The other specimen that I have to describe consisted in a united supernumerary tooth with a dens sapientiae of the lower jaw. The latter tooth presented nothing unusual in its form; but was in every respect a perfectly natural dens sapientiae. I would particularly observe upon the complete formation of this tooth, it had the usual number of cusps and fangs, so that the supernumerary tooth could not be considered as a portion of this tooth separated from the rest. The supernumerary tooth was much of the form and character that these teeth usually present, irregularly cylindrical and twisted. These teeth were united together by their necks; the crowns were perfectly distinct, and there was no continuity of enamel at any part. The fangs were quite separate; and the pulp cavities did not appear to have any where coalesced. (See fig. 1, *d, e.*) A section through them at the point of union presents an irregular form. In the dentine are seen pulp cavities corresponding with the fangs of the teeth. (See fig. 1, *f.*)

On account of the obliquity of the crown of the supernumerary tooth, the section which cuts the neck of the dens sapientiae, passes through the crown of the former; so that whilst the dentine of the wise tooth is seen to be surrounded by crusta petrosa, that of the supernumerary is bounded by enamel.

By referring to the drawing it will be seen, far better than can be described, that the dentine of both teeth is

continuous and unbroken, as in the other specimen, and that the structural union is complete. (See fig. 3.)

These two specimens then establish the fact, not only that the teeth are occasionally united together, but that the union is effected by a fusion of the dentinal tissue of the two individuals; and in these cases at least the union could not be said to be *bony*. It appears, however, not otherwise than probable, in some cases of slight union of the fangs, that the connection may be effected by *crusta petrosa*. It is possibly so in one of Mr. Fox's specimens in the Guy's Museum.

As regards the development and formation of these united teeth, it appears certain that calcification must have commenced upon distinct pulps within the same sac. That the pulps were from the first in actual contact, cannot, I should imagine, be doubted, not only from the proximity of the two teeth, but from the absolute continuity of the tissue composing them. Moreover, in the first specimen referred to, it would seem, from certain appearances observable at the margin of the union, that, when in an early condition and prior to calcification, the pulps had received an amount of pressing together at their surfaces.

There is still another point of much physiological interest and significance noticeable in the first specimen; between these teeth, where they are united at the crowns, no enamel is found; whereas, on every part of the surface which was exposed to contact with the interior of the sac, the organs are clothed with enamel, a circumstance which not only indicates that the pulps were from the first in contact, but is also an additional proof (if indeed such were wanting) as to what is the source of the enamel, and that, as described by Hunter and subsequent anatomists, it is really the product of the inner surface of the dental sac.

Although the adhesion of two teeth together must be looked upon as an abnormal condition, still in the absence of all morbid products and change, it may be considered as one of the lowest order, and abnormal in the slightest degree; and viewed in relation to the development of dental forms

and tissues, it can scarcely be considered as more than the result of some modifications in the papillary and follicular mouldings of the mucous surface which occur in the earliest stages of tooth-development. And considering that the near proximity of two pulps, or the imperfect formation of the septa between the sacs, would furnish circumstances favouring (if not determining) its production, it is rather a matter of surprise that this deviation from the natural condition is not much more frequent.

The union of distinct teeth, formed upon separate pulps, and exhibiting the anatomical form of perfect teeth, is merely an exhibition of the same sort of process on a large scale, as we see in miniature in the formation of every tooth with more than one cusp. Each cusp commences, as each single tooth, by a separate calcific centre upon a single eminence of pulp; upon, in fact, a miniature tooth pulp; and, when these become confluent, they show through a very short space, near the summit of the crown of the teeth, the same relation in section as I have described in my specimens; and it only needs a deep fissure between the cusps to render the analogy more complete. These, however, are normal; what I have described are abnormal; nevertheless, a departure from what is natural more in form, position, and degree, than in kind.

Having established the anatomical fact of dentinal union of distinct teeth, I will say a few words on its practical bearings.

It is obvious that two teeth may be united side by side, though apparently distinct organs; one may be diseased and require extraction, and the other be sound. Now, in the *majority* of cases I have cited, it would have been impossible to have ascertained the union of the teeth whilst in the jaw. In *all* the recorded cases it would have been impossible to have separated the attached teeth before extraction. From these grounds it is obvious that some few cases have occurred, and will, in all probability, occur again, in which the surgeon, in removing a tooth, removes two, without anticipating such

a casualty, and even had he suspected it, without having it in his power to prevent it.

Since the above Paper was written, another example of this condition has come under my notice. A young gentleman presented himself for advice on account of the peculiar appearance of the right central and lateral incisors of the lower jaw. These teeth, which are of the permanent set, are blended together more completely than any other examples I have seen. On the anterior face is a slight groove between the upper half of the crowns; below and down to the necks all indication of division is lost. On the posterior surface is a spiculum of enamel projecting from the line of union. As the teeth are still in the mouth, I have had no opportunity of examining their fangs. I beg to exhibit to the Society a plaster cast taken of the teeth.

POSTSCRIPT, *Aug.* 1852.—Since the above has been in type, I have found other instances of dental union. Rhodigius mentions instances of this condition. (*Lecton. Antiqu.*, 1517.) Haller also enumerates examples of it. (*Elem. Physiol.*, vol. vi.) Otto mentions an instance of two incisors united together by their crowns; and another where two molars were adherent by their fangs; another where three incisors of a child were united by their roots. (*Anat. Pathol.*, 1829.) In the Museum of the Royal College of Surgeons (*Prep.* 146) is a molar tooth of the upper jaw ankylosed to the adjoining one, which is inverted. *Preparation No.* 265 exhibits two united incisors; and *No.* 266 two tusks of a young elephant on the same side of the jaw, united throughout, and the pulp cavities communicating laterally.

Fig. 2.

Magnified Section of United Cuspidatus and Lateral Incisor.

Fig. 1.

a. United Cuspidatus and Lateral Incisor. b. Section of the same through the crowns.
c. Section through the fangs. d. United Dens, Sapientia and Supernumerary tooth.
e. Another view of the same. f. Section of them.

Fig. 3.

Magnified Section of the united Dens Sapiientia and Supernumerary Teeth.