PERFORATING GUNSHOT WOUND OF THE FACE WITH EXTENSIVE DESTRUCTION OF THE SUPERIOR MAXILLAE.

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In publishing the following observation, I desire, in the first place, to give testimony of the very appreciable services which the dentists rendered to the surgeons throughout the whole period of the recent war, in relation to those operations necessitated by wounds of the jaws. As I have already shown in two previous papers,* the experience which has been gained, during the last five years, has proved that in restoring any injury located on the lower part of the face, the co-operation of our confrères engaged in the profession of dentistry, was almost indispensable. Left to his own resources, the surgeon would often find it impossible to give to the patient the most judicious treatment. If he attempted to do everything alone, the esthetic or functional results, in most cases, might leave much to be desired. The case of the wounded soldier, who is the subject of this paper, is a convincing illustration of this fact, as I will proceed to demonstrate now.

Case report: Captain E. C.,** 26 years of age, belonging to an infantry regiment, was brought under my care, at the Canadian Hospital at St. Cloud, on April 26, 1916. He was suffering from a large wound of the face, having, on the 16th of April, at Verdun, been struck by a bullet which had apparently been reversed in its cartridge casing, and was fired from a distance of about twenty metres. The manner in which the officer's face was shattered, and the fact that bullets reversed in their cartridge casings were found in trenches subsequently captured from the enemy, led me to believe this conjecture was most probably a true one. The projectile entered the man's left cheek, inflicting a vertical wound, half-open, about five centimetres long, and having the malar bone at the upper extremity. After having almost wholly destroyed the superior maxillae, the bullet passed out on the right side, at junction of nose and cheek, causing considerable disfigurement. The maxillary sinuses, the turbinated bones, and the nasal septum, were demolished, leaving nothing but a great single cavity. The bones of the nose were

*J. N. Roy. Quelques cas de labioplastie. L'Union Médicale du Canada, Avril, 1919. Le traitement chirurgical des fractures du maxillaire inférieur. L'Union Médicale du Canada, Juillet, 1919.

**This officer, while under treatment, was shown to the Inter-Allied Dentists Congress, held at Paris in November, 1916.

fractured, and this organ having no longer any support, had already begun to sink in, being drawn towards the right side. Two-thirds of the left side of the roof of the palate had been destroyed. The three molars, attached to the only remaining portion of this maxilla, were still wedged on the right side, and this bone, broken away from its surroundings, was dragging on the tongue. The upper lip, which was split near the middle, had no nasal contact on the right, but hung on the lower lip, at the point where the two lips join. Up above, the region of the lacrymal sac was likewise injured, and the patient complained of diplopia. Apart from this trouble, the vision of each eye was excellent, and the floor of the right orbit was intact.

Figure 1.

The condition of the lower maxilla was normal.

The ears, fortunately, did not suffer from any of the effects produced by the trauma.

The wound suppurated freely, and the patient, very weakened, had a little temperature.

I proceeded to sterilize this wound, as quickly as possible, by removing the loose splinters, by irrigations and buccal pulverizations frequently repeated, and with dressings renewed twice a day. Tonics and a generous diet aided the local treatment so well that I decided to proceed to surgical treatment, at the beginning of May. (See photograph No. 1, taken on the 8th of May.)

The first operation took place on May 10. After administering anesthetics and completing the preparations ordinary to all operations, I scraped as thoroughly as possible, with the curette, the wound on the left cheek. I then sutured the skin after having carefully loosened and freshened the edges. The drainage being good through the mouth, union by first intention resulted. In order to gather up and hold together the fragment of the maxilla, which was hanging on the tongue together with the three teeth, I had, before commencing the operation, ordered a metallic crown which fitted to the head, and rested solidly on the superciliary ridges.

Figure 2.

After all the splinters of bone had been scraped away and removed from the cavity, between the mouth and the right side of the face, a Reverdin needle, passed through the wound, at the gingivolabial junction, was armed with a brass wire, the inner of which encircled the fragment of the maxilla. In order to avoid cutting the surrounding tissues, I passed this wire, after gently twisting it, into an india-rubber tube. I then drew it up, and after putting what remained of the superior maxilla into its position, I attached the brass wire to a hook which formed part of the frontal metallic crown. The three teeth coaptated well with the corresponding molars of the inferior maxilla, and as a result, and by means of appropriate dressings, I was able to control the retracting cicatrice, and obtain perfect and definite dental contact. Then I sutured the

upper lip, the ala of the nose and the region of the lacrymal sac. There still remained a large opening at the side of the nose through where I could make aseptic irrigations, dressings, and watch the healing of the tissues.

Post-operative recovery was quite normal, and on May 22nd, I removed the brass wire, the fragment of the superior right maxilla having by that time become adherent to the surrounding tissues. However, that fragment, consolidated by portions of osseous lamellae, presents such an elasticity that probably it will be impossible, in the future, to apply a prosthetic apparatus thereto.

Figure 3.

The wound on the right gradually contracted, and the suppuration diminished from day to day.

The patient having previously suffered from influenza, he developed an otitis on the left side, on June 19. This otitis, very acute, necessitated a paracentesis, and was complicated by mastoiditis. By the application of ice, and proper dressings, the officer's condition improved, and there was a complete cure by July 28.

Gradually the nose, no longer having any supports, sank in and deviated to the right, being drawn into the interior by the cicatricial tissue. (See photographs Nos. 2 and 3 taken on September 20.)

Diplopia had now entirely disappeared.

Suppuration ceased, healing of the wound followed its ordinary course, and in September, the fragment of the superior maxilla had

consolidated in the manner previously described. The opening, at the side of the nose, had now diminished to a narrow fissure.

In order to place the nose in its normal position, and maintain it there after the operation, I asked Dr. Geo. Villain, professor at the Dental School of Paris, who was attached to my department in the quality of chief of the technical service, to make a prosthetic apparatus which would be capable of taking the place of the superior maxillae, and the nasal septum, that is to say, an anatomical support for the nose. Thanks to his great skill and ingenuity, Dr. Villain succeeded in constructing an ideal instrument, of which he has been good enough to furnish me the following description:

Figure 4.

"Seeing on the one hand, the almost total loss of the superior maxillae, and on the other hand, the slight resistance of the fragment which remained consolidated on osseous lamellae, it was not possible to find, on these maxillae, any point of solid support for the construction of a skeleton apparatus. Neither would the inferior maxilla serve as a point of support, on account of the great mobility of that bone. It was, therefore, necessary to choose a more stable place to obtain the desired purpose. The direction, inner and outward, of the cicatricial forces, which were very powerful, would not permit the utilization of an apparatus which would take the skull as the sole point of support against these forces.

"Inspired by the method, extolled by Kazanjian, I constructed a

frontal plate in vulcanite, moulded on the forehead, and grasping as firmly as possible, on the superciliary ridges. A vulcanite splint, attached to the lower teeth, was connected to the frontal plate with sliding lateral tubes. Thus given absolute rigidity, the apparatus was a marvelous anchorage, and one which would support considerable force. The inferior maxilla, having a slight mobility, could move up and down within a radius of several millimetres in the splint. Moreover, to guard the patient against fatigue, the sliding lateral tubes allowed one at will to increase or decrease the fronto-maxillary distance; two small screws fixed the apparatus at

Figure 5.

the height desired. To push over the nose, and maintain it in its proper position, after liberating the cicatrices, I utilized two metal rods, which were each bent at a right angle from its extremity. One extremity was folded in the shape of a U, and thrust into a small vertical tube which was soldered to the sliding lateral tube, and the other extremity, covered with gutta-percha, was destined to penetrate the nostril, in order to keep the nose in its normal position.

"Thus disposed of, the rods were capable of being drawn by sliding them vertically up and down. This gave the surgeon proper facility for the antiseptic treatment of the mouth and nose. In addition, it gave play to a certain elasticity which prevented erosions of the mucous membranes of the nose.

"On the lower splint, two horizontal tubes were provided to receive a labial skeleton plate of tin, to be used when the time would arrive to proceed to the labioplasty. Thanks to a special provision, this plate will serve not only to support the lip, but also to dilate it."

The apparatus completed, I proceeded to the second operation, which took place on September 23.

Chloroform having been administered to the patient, I made an incision through the whole cicatricial tissue, from the root of the nose to the lip inclusively. The nose having been completely sep-

Figure 6.

arated, as far as the point between the eyebrows, it was easily drawn out. Although the bones were fractured, they still adhered to the nasal pyramid, and were carefully preserved for the later purpose of serving as a solid point of prosthetic support. The apparatus was then placed in the mouth and on the forehead, and two metal rods, with a covering of gutta-percha at their extremity, were introduced in the nasal fossae, maintaining the nose in its normal position. I made two sutures at the upper part of the wound. Definite restoration of the lip was naturally left for a third operation. (See photographs Nos. 4 and 5, taken on September 25.)

The results of the intervention were excellent. Irrigations and antiseptic dressings were made daily, and particular attention was paid to nasal nutrition. From time to time, the nose changed color, turned from white to red, or became swollen. I corrected this

trouble, which was one of circulation, by modifying the prosthetic rods which had their point of support in the nasal fossae, and more or less compressed the surrounding tissues.

Towards the end of October, as nutrition of the nose seemed to be satisfactory, I decided to repair the upper lip. As, however, the metal rods, placed in the nostril, were in my way, I asked for such modification of the first apparatus as the exigencies of the operation necessitated. My excellent friend, Mr. Bouillant, chief of laboratories of Military Dispensary No. 45, took charge of this delicate work, and replaced the skeleton rods by a nasal supporter introduced at the part of the roof of the palate which had been destroyed. This supporter, destined to assure a sufficient but not compressive support, was capable of expanding the tissues, and so prevent cicatricial retraction. It was mounted on three metal rods, penetrating the tubes included in the depth of the lower splint, and it could be easily dismounted. The nasal part was formed of a soft elastic pad hooked to the apparatus, which rendered its replacement easy. The pad was thrown forward by means of a nut manoeuvring on the central rod, and came into contact with the lower part of the bone of the nose, which was now in excellent position.

The third operation took place on October 31.

Chloroform was again administered and, aided by my excellent comrade and friend, Major Chs. Saint-Pierre, the patient was carefully prepared with a view to autoplasty. I detached entirely the bundle of flesh which formed part of the upper lip, and proceeded to a minute ablation of the cicatricial tissue. The lip, which had been torn to within two centimetres of the commissure, was liberated, in following the line of the traumatism. The left part was then freshened up, and as it was somewhat retracted, I made a horizontal cutaneous incision, and a slight dissection in a manner to augment its depth. The two extremities of the labial mucous membrane were sutured with silk, after having been given a little outward tuning. There still remained to be filled up more than one-half of the upper lip. In order to accomplish this, I cut a flap from the cheek and neck, about eight centimetres long and three centimetres wide, in continuing the first incision near the commissure. This flap partially detached, had then its pedicle under the right malar bone. It was carefully coapted with the lip from the left side and at the labial mucous membrane, which had been previously sutured, and put into place. The prosthetic apparatus furnished an excellent point of support, and prevented retraction. After having

loosened the skin on the chin, neck and cheek, it was easy to completely close up the wound caused by taking of the flap. A light compressed dressing terminated this operation of labioplasty.

The outcome of the operation was again satisfactory. On account of abundant buccal secretions of a nature likely to cause complications, I ordered that irrigations and dressings should be made every day. The flap was well nourished, it adhered to the surrounding tissues and maintained its physiological color. The labial mucous membrane, on the right side, encroached for the moment on the skin to which it was sutured. Later, when the cicatricial work will have produced its effect, it will be an easy matter, if the thing persists, to correct this asymetry by a simple intervention.

The nose presented no inflammatory reaction, and kept its normal appearance as regards its prominence.

The wound on the cheek and neck healed by first intention, and left a cicatrice that can hardly be seen. (See photograph No. 6, taken two days after the operation.)

Owing to my departure from France for England, I must unfortunately bring this observation, which is personal to myself, to a close, with this last operation. It remained for me, in the future, to cut the pedicle and fill up the wound, at the junction of the nose and cheek, by means of a flap taken from the right side of the forehead. I would not have been justified in performing that operation at the time of the third intervention, in view of the presence of the septic secretions, and the necessity to watch the vitality of the flap, vitality being always problematic in this kind of surgery.

The patient was removed to another hospital, and there, he underwent, with complete success, the remainder of his operative treatment. A definite prosthetic apparatus, taking its point of support on the lower dental arches, was made to replace the superior maxillae which were destroyed. Furthermore, that prosthetic apparatus provides a stem for the nose which it maintains in an excellent position without the aid of any external facial support.

The patient has grown a moustache, and the esthetic result achieved is as perfect as is reasonable to hope for. Captain C. is highly satisfied with the results obtained, and at the end of 1917 he was able to rejoin the army, and take up duties on the headquarters-staff of an infantry brigade. Judging by his present appearance, nobody would be able to realize the vast disfigurement of the face presented by this officer, after his glorious wound.