DISEASES OF THE SALIVARY DUCTS AND GLANDS AND THEIR TREATMENT. REPORT OF CASES.

BY ROBERT C. MYLES, M.D., NEW YORK.

The diseases commonly associated with these organs are fistulæ, inflammations, both specific and non-specific, cysts and other tumors, and sialolithiasis.

The affection to which the term sialolithiasis is applied is often considered as a comparatively rare disease. Salivary calculi are more often found in the ducts than in the glands themselves. The most common site is the submaxillary duct and gland, next the parotid, with Steno's duct, and lastly the sublingual glands with their excretory ducts. Statistics show that the duct of Wharton and the submaxillary gland contain over 60% of all salivary stones, the parotid about 20% and the sublingual about 18%. Men seem to be more often affected than women, and especially during the middle years of life. Children are rarely affected, but one instance where a congenital salivary calculus was present, has been reported. The larger stones are usually found in the glands. The size and number vary within considerable limits and bear a certain relation to each other—the more numerous the stones, the smaller they are apt to be. The form and shape of these calculi are determined to a certain extent by their situation—those occurring in the excretory ducts being elongated and cylindrical, while those in the gland are round and irregular. Salivary stones are composed of both organic and inorganic materials, the latter usually phosphate of lime, less often the carbonate, or sometimes both together. The organic constituents are bacteria and salivary corpuscles.

A number of theories have been advanced to account for the origin of these calculi. In some cases foreign bodies which have found their way into the ducts or glands, form a nucleus for the deposit of the mineral salts. During recent years, however, it has come to be believed that an infectious process underlies their formation, as for the production of concretions elsewhere. Klebs and Galippe have shown that the bacteria found in the interior of the calculi are derived from the mouth. Some of them may have settled on some rough spot in the mucus membrane of the ducts brought about by an inflammatory disturbance. Around this clump of bacteria, the con-

* Read at the Tenth Annual Meeting of the American Laryngological, Rhinological and Otological Society held at Chicago, May 30, 31 and June 1, 1904.

cretion forms. In addition to bacteria, Hanszel alludes to two other etiological factors—a chronic inflammation of the gland substance with retention and thickening of the secretions, and long continued irritation, such as may be produced in the sublingual region by the mouth piece of a tobacco pipe. Klebs considers that the *leptothrix* bacillus is also one of the frequent exciting causes.

As long as it does not cause complete obstruction, a stone or other foreign body may remain in situ in the duct or the gland for many years without producing any symptoms. Very often a stone suddenly makes its appearance in the mouth during a meal. In general it may be said that the disturbances are more serious when the stone is situated in the duct than when it is located in the gland. The most characteristic symptom is the intermittent appearance of a salivary tumor produced by the salivary stasis. Such attacks are accompanied by severe pain and are aptly termed by the French, "*coliques salivaires*." The pain may come on suddenly during a meal, or in some instances even at the mere sight of food. The duct often becomes inflamed and a *pyorrhœa* follows. *Ranulke*' stomatitis and salivation are also ordinary accompaniments of the condition.

The affection is not so uncommon as is ordinarily supposed. As the means for recognizing the disease are becoming better known, an increasing number of cases are being reported. In the last available issue of the Surgeon General's Catalogue, over 100 papers on the subject in question are recorded. The diagnosis depends on the recognition of the stone with the finger or the sound. If the physical signs are less prominent, but the characteristic attacks are present, the possibility of a stone should always suggest itself, although a similar train of symptoms may be brought about by inflammatory disturbances in the excretory ducts. Lately the employment of the X-Rays has afforded an important aid to diagnosis, as illustrated in the reports of Alsberg and Gerota, who employed them for this purpose. Many cases are undoubtedly mistaken for an alveolar periostitis, when the inflammatory symptoms occupy the foreground of the picture and render local examination a difficult matter. Where the gland itself is the site of an inflammation due to the presence of a stone, it may be difficult to exclude a simple inflammation of the gland or even of a lymph node. Where the development proceeds very slowly and without marked inflammatory symptoms, malignant tumors, tuberculous lymphomata, gummata or osteomata may be diagnosed by mistake.

Treatment should be directed to removal of the stones through the mouth whenever possible. Kuttner states that the only exceptions to this rule are the presence of an external fistula leading to

the concretion, or when the latter lies in an external abscess, or when the parotid or maxillary gland itself is the seat of the stone. Where the calculus is near the orifice of the duct, it may in many cases be readily squeezed out, but where it lies deeper it is necessary to slit open the duct. These operations may be done under local anæsthesia. Where the stone is in the submaxillary or parotid gland, an external exposure is often necessary, supplemented by the entire or partial resection of the gland. When operating on the parotid the facial nerve must be carefully protected. Hanszel reports a case where the operation was followed by a slight facial paralysis.

The writer has had under observation a series of very interesting cases which he is desirous of placing on record.

Case I. Mrs. M., consulted me for a large tumor under the left side of the tongue, which interfered with speech and also with the complete closure of the mouth. She presented the peculiar characteristic appearance of the mouth and face which is associated with this class of cases. Examination disclosed a cystic tumor about the size of a hen's egg, situated between the tongue and the lower jaw, and extending from the incisor back to the last molar tooth. The tongue was displaced to the right and upper part of the mouth. The diagnosis was self-evident. The contents of the cyst were evacuated by incision, and after a few days when the swelling had subsided, a small probe similar to the one shown, was passed into Wharton's duct. A collection of small calculi was detected about $1\frac{1}{4}$ inches from the ostium. By the aid of cocaine anæsthesia, the calculi were removed with a curette, the extraction being accomplished with considerable difficulty. The duct was gradually dilated with silver bougies. The cyst wound healed slowly and the cavity contracted. The duct was kept open by silver sounds passed every two or three days for a few months, and the patient made a satisfactory and complete recovery.

Case II. I was called in consultation by a general practitioner to see Mr. H. He gave a history of having suffered with soreness and fullness of the right side of the base of the tongue, the floor of the mouth and the larynx. He was very stout and had a short, thick neck. There was serious interference with respiration. The epiglottis was intensely swollen and was pressed upon by a large teat-like swelling on the lowermost part of the base of the tongue. A small fistula was to be seen in the floor of the mouth near the last molar tooth. The œdematous epiglottis was incised in several places with a protected laryngeal bistury and the swelling rapidly subsided to about half its former size. The projection at the base of the tongue was seized with a lingual tonsillotome and its apex cut away.

It contained a burrowing cystic abscess, filled with salivary and muco-purulent secretion. All the alarming symptoms rapidly subsided. Careful bimanual palpation then revealed a rounded mass in the location occupied by the submaxillary gland. The lumen of the canal was then enlarged by the introduction of a rectangular knife. With a probe it was possible to feel a foreign body about $\frac{3}{4}$ of an inch from the surface. A pair of dilators of the same pattern as those used for the cervix uteri were then inserted and the tract dilated to about 15 millimetres. By means of curved forceps and the curette, several small pieces of calcareous matter were removed. A curved silver probe which was introduced, could be passed by the submaxillary gland, under the base of the tongue and into the cystic cavity which had previously pressed upon the epiglottis. The wound was packed for several months and gradually healed by granulation. Several attempts were made to introduce a sound into Wharton's duct, but it was impossible to penetrate the normal opening. The patient was dismissed some months ago and has had no further trouble.

Case III. This case I have previously referred to at a medical meeting. The patient was an officer in the regular army and while on post duty had suffered so much from the pain and distress caused by his condition, that he was compelled to neglect his official duties and was wrongfully censured. There were few objective symptoms. A small lump could be felt in the submaxillary region. I succeeded in passing a probe through Wharton's duct and when it reached the maxillary gland, it came in contact with what was apparently a stone. An incision was made through the floor of the mouth near the last molar tooth and close to the gustatory nerve. The incision was then forcibly dilated with a uterine dilator. The stone was found to be imbedded in a net-work of fibrous tissue bands, which occupied the crevices in the roughened calculus. The latter was pulled up into the floor of the mouth with tenaculæ and rate tooth forceps and the adherent bands severed by a curved knife with a very sharp point. The stone was then extracted, the duct dilated, and the patient made a complete and uninterrupted recovery and has continued well for several years.

Case IV. Mr. N., a business man about 40 years old, applied to me for relief for a swelling beneath the anterior part of the tongue, which extended down behind the chin to the hyoid bone. An incision was made into the tumor and the characteristic salivary secretion evacuated. This patient was one of my first cases and I had not thought at that time of forcible dilation of the duct. I tried for several months every method that I had ever heard of for curing

the condition. I made openings into the cavity, and kept them open for weeks with tubes. Then I curetted, applied carbolic acid, and still the thing recurred. I requested a general surgeon to try and relieve him. He made an incision from the chin down to the thyroid cartilage, exposed the entire extensive cavity, dissected away all the membrane he could find, and thoroughly cauterized the surface with Pacquelin cautery. The condition again recurred, however, and another surgeon removed the sublingual and submaxillary glands. This cured the cystic condition, but the distress caused by the constant lack of saliva, gradually made the man morose, melancholy and apathetic, and caused him to spend most of his time endeavoring to moisten the dry area on the operated side of his mouth by placing his tongue over it. This was accompanied by a gradual decline and the patient finally died from what was apparently a form of dementia and malnutrition.

Case V. This is a young woman about 25 years old, an actress in one of the leading New York theatres. She consulted me about three months ago. Examination showed a stone lodged midway in Wharton's duct as large as a pea. From time to time it obstructs the flow of saliva, but otherwise does not cause any serious inconvenience. As she is playing an important engagement, I have advised her to wait until the end of the season and then to have the offending calculus removed.

The points of interest taught by the histories of these cases are, first, that it is necessary to make a thorough test of every known method in order to obtain a correct diagnosis in suspicious cases; second, that the removal of these calculi can best be accomplished by surgical procedures, preferably through the floor of the mouth, and third, that it is always well, where possible, to probe and dilate the duct, and thus to establish and maintain the normal flow of salivary secretion.