infection. Emphasis is intentionally laid upon an apparent absence of local manifestations because the naso-pharyngeal tonsil being "terra incognita" to most physicians lies also out of sight and therefore out of mind. Moreover, it is seldom possible during an acute infectious invasion of this region to make use of the rhinoscopic mirror. In individual cases, therefore, the skilled observer depends upon past experiences, and either immediately resorts to digital exploration, or direct treatment of this region. It is invariably the case that the first tonsil is entirely forgotten by the physician because the systemic disturbance would seem to demand so much attention. The fact remains, however, and has recently been explicitly confirmed by T. Clifford Allbutt, that reinfection is a constant factor in influenza, and this must occur, in the present writer's opinion, through the first tonsil. It is his belief that the most likely agency in this process of reinfection is the patient's own clothing. In the daytime the handkerchief, towel, and outer garments, and at night the bedding, more especially the pillow, serve as the media for this reinfection. Taken in connection with the fact that the situation of the infected areas in the naso-pharynx together with its condition of repose during sleep, during which the nasal chambers are more completely filled on account of a reflex vaso-motor paralysis, and respiration is more buccal than nasal, all conditions favorable to the development of noxious micro-organisms obtain.

In eliciting the presence of this symptom of soreness of the throat one should ask the patient if there is soreness or pain upon swallowing, then by watching the act performed one may note if there is difficulty or slowness, or if the head is held in any favored position. Examine the fauces under good illumination to determine to what extent, and upon which side, an acute process is situated. Feel along the sides of the neck for tender lymphatics and glands. Examine the nose and note its condition as regards swellings and secretions.

In the majority of cases study of the character of the voice will determine the location of the more important lesions. Hoarseness indicates affection of parts below the pharynx. A nasal tone implies obstruction, and the type of tone varies with the location: deeper if post-nasal, high pitched and feeble if nasal; in a monotone and repressed if there is extensive exudation and swelling, as in tonsillary abscess.

While deciding the question of diagnosis between what may be termed acryptic and cryptic infectious diseases, the former, because of their accompanying rashes being almost self-evident, while the latter are entirely concealed, it is allowable to use the cotton carrier dipped in some sterile liquid. Passed into the post-nasal space it will almost always reach the "sore spot" and will be brought out coated with blood or purulent material. Cultures made from dry swabs should include exudates from the deepest parts, although the discovery of any pathogenic germs in the nasal discharges is confirmatory of corresponding con-

ditions. For example, if Pfeiffer's bacillus of influenza is present in the muco-purulent nasal secretion it may be correctly inferred that the constitutional symptoms are the syndromes of the local infection which cause the "sore throat."

Treatment for "sore throat" is palliative or curative. Often with feelings of deep regret the writer recalls his early experiences with cases of throat disease. In the light of acquired knowledge the differentiation of the various constitutional diseases, including the exanthems, with the localization of their port of entry, have served to remind him of the fallibility of man, and he wonders at the credulity which caused him to prescribe sprays and gargles which ever proved valueless and inert.

It has been clearly indicated in this article that "sore throat" is usually the symptom of the invasion of the post-nasal tonsil, and through the circulatory system, of the economy by an infection. This latter, which was formerly spoken of as a contagium vivum, is now understood to include with the true materies morbi a specific micro-organism, its toxins and their various derivatives.

In children, whose post-nasal space is usually filled with adenomatous masses, and in whom exposure produces congested throats, this invasion may be the precursor of one of the exanthems, such as measles or scarlet fever, or of even more serious contagious disease, as diphtheria, cerebro-spinal meningitis, and of pertussis, of rheumatic fever, or of influenza.

These serious infections should be treated locally with the energy and thoroughness which their character demands. It is inconsistent with theory to allow the dangerous sequelæ which are constantly occurring from the toxemia to continue, and it is unwise, even with diphtheritic cases, to place full dependence upon the use of anti-toxin.

The writer, therefore, firmly advocates the removal of adenoids and direct sterilization of the naso-pharynx at the earliest possible moment.

Clinical Department.

A CASE OF RECURRENT SPONTANEOUS GANGRENE OF THE INDEX FINGER: SUCCESSIVE AMPUTATIONS OF THE PHALANGES: ABATEMENT OF THE PROCESS AFTER EXCISION OF A PORTION OF THE RADIAL NERVE AND STRETCHING OF THE MEDIAN.*

BY E. A. CODMAN, M.D., BOSTON,

Surgeon to Out-Patients, Massachusetts General Hospital.

THE patient was a slight, undersized girl of sixteen years, of somewhat nervous appearance and behavior, and was first seen at my clinic at the Massachusetts General Hospital on May 16, 1904. Her mother is living; her father died of "heart trouble." She has one sister and seven brothers; all are living and well. Twelve weeks before I saw her, she first began to have trouble with the index finger of the right hand. She

* Read at the Surgical Section of the Suffolk District Medical Society (Library Meeting), Jan. 24, 1906.

said that it began by a cut from a piece of glass. This cut was a mere scratch and could hardly be seen. At this time a black spot appeared on the tip of the finger and there was great pain in the finger radiating into the arm and shoulder. Presently the skin on the palmar side of the tip of the index finger all turned black and the pain became less. On the next day she went to the Boston City Hospital where she says that they scraped the spot, and for the following two months, treated it with "many salves, powders and other things." About the 1st of May she went to the Homeopathic Hospital where the lesion was treated for a week.

At the time I saw her, May 16, 1904, it was noted that there was a circular ulcer on the palmar side of the tip of the right index finger with round contour and concave surface. The base of the ulcer was formed by exposed phalangeal bone and there appeared to be no attempt at healing. There was no proud flesh, no induration, no inflammatory thickening of the edges or of the joint. The sore resembled a primary lesion except that it was not indurated and the bone was exposed at the base.

On May 17, I gave her ether, amputated the terminal phalanx, and, since it was not likely to heal by primary union, I merely approximated the flaps with one silk-worm gut suture. A section of the wall of the ulcer was examined by Dr. J. H. Wright who reported that there was no evidence of syphilis or tuberculosis. Two days later the wound showed slight infection. On the eighth day I removed the stitch; redness and inflammation were subsiding. The tissue looked healthy, but the granulations were not active and on the whole had much the same appearance as when first seen.

On June 13 the wound had entirely healed, but the stump was painful.

On June 21 she was discharged well. On June 23 the wound had broken open again and it was decided to amputate somewhat higher in the finger. On June 25 part of the second phalanx was resected and the wound closed with a protective wick. After this operation there was a good deal of pain. On July 12, the seventeenth day, there was a necrotic dark-colored area on the tip of the stump, no redness or inflammation. On July 19 it was noted that the area was decreasing in size. From July 19 to Nov. 3 I have no notes. The patient went to New Brunswick on Sept. 15 and returned in October. During this time the finger had been painful and is said to have healed or nearly healed about the 1st of October.

On the night of Nov. 1 her whole arm pained her very much and when she woke up in the morning she found that at the base of the stump of the index finger there was a black gangrenous spot the size of a dime.

On Nov. 3 she came to the hospital again and it is noted in the records that over the metacarpophalangeal joint of the index finger there was a gangrenous dry area, slightly smaller than a dime. There was a rim around this area of white and beyond this the skin was slightly reddened. The whole hand was cold and damp and the girl shrank at any attempt to touch it.

On Nov. 5 the area of gangrene was increasing in size. The pain was severe enough to keep her awake.

The examination on Nov. 10, as recorded in the records of the Skin Department, for which I am indebted to Dr. Bowen, is as follows:

"Right index finger has been amputated at the middle of the second phalanx. At the base of the index finger on the back extending to the inner side is an ulcerated lesion 1 in. by $\frac{3}{4}$ in. in extent. This is roughly quadrilateral in outline with undulations. Its base is slightly below the surface level and is covered by a homogenous black crust. The edges of

the ulcer are not elevated above the surrounding surface and slope slightly to the base. The forefinger and the outer half of the hand extending slightly above the wrist are swollen and the color is very slightly erythematous. The forefinger as far up as the base of the middle phalanx and along the line extending up the arm along the nerve is markedly tender on pressure." She was given various ointments and general tonic treatment and was admitted to the Skin Ward for observation.

On Nov. 12 the area of gangrene had somewhat increased peripherally, but not in depth. To eliminate the possibility of malingering, a sealed dressing was applied.

On Nov. 14 the area was not increased. The slough was apparently coming off. One corner of the stiff plaster dressing near the site of the lesion was torn, suggesting that the patient had made an effort to remove it. The ulcer was beginning to fill in from its base with bright red granulations. Its mural surface was somewhat less in extent. The hyperesthesia was much less marked.

On Nov. 25 the ulcer was filled in from base leaving a granulating area on surface, moist, pale red, of size of ten-cent piece.

Dec. 1, nothing remains but superficial ulceration, which is healing rapidly from its sides, so that the ulcerated portion measures $\frac{1}{2}$ in. in both diameters.

Dec. 3, 1904. While convalescent in Skin Ward.

Dec. 2, sealed dressing left off.

Dec. 8, original lesion is now occupied by an area of redness which is healing, except for minute central and superficial ulcerations. About periphery two or three dark-red, fairly elastic elevations. On the edge towards middle finger is a grape-seed-size, firm, nodular, circular lesion, very slightly elevated. Some tenderness in and about lesion. Skin about nodule looks wrinkled.

Dec. 9, this morning on removing compress put on in ordinary way, there appeared a round, superficial ulceration, $\frac{1}{4}$ in. in diameter, base smooth, shiny and dry. Considerable hyperesthesia. The patient has been aware the last few days that she was to be sent home. Sealed dressing reapplied.

Dec. 17, site of old ulcer entirely healed, leaving smooth, shiny surface which is red and slightly infiltrated. Sealed dressing left off.

Dec. 19, patient was informed on Dec. 17 that probably the next day she would go home. To-day, without any premonitory subjective symptoms, there is present over the site of the old lesion an elongated area, denuded of epidermis, about $\frac{3}{4}$ in. wide with base secreting profusely, the edge showing tag of epidermis,

suggesting remains of vesicle. Sealed dressing re-applied.

On Dec. 21 the lesion was healed over with crust formation.

Dec. 25, patient has symptoms of sore throat.

Dec. 26, diphtheria, transferred to the South Department of the Boston City Hospital.

On March 4, 1905, the patient appeared again at the Massachusetts General Hospital. She said that during her absence the finger had not really healed and that the day before in five or ten minutes there suddenly appeared a lesion on the inner side of the right index finger. The character of the lesion when first seen is not noted, but on March 4 it is described as an ulcer $\frac{1}{2}$ in. in diameter covered with a blackish eschar.

On March 9 the ulcer occupied the inner(?) side of the finger and was covered with a blackish crust.

March 17, she entered the hospital in the service of Dr. S. J. Mixer. Ether was given and the stump on the index finger disarticulated at the metacarpophalangeal joint. She was discharged to the Out-Patient Department, March 24. Whether primary healing occurred is not noted.

On April 13, it is noted that a gangrenous area had appeared on the back of the hand on the inner end of the amputation scar. At this time I saw the patient again in the Out-Patient Department and made an incision, under cocaine, about half way up the arm and excised two or more inches of the radial nerve, starting at the point where it emerges from the fascia; at the same time I excised and curetted out the gangrenous area.

On April 17 the wound was clean.

On April 18 a small area of gangrene appeared to the inner side of the seat of the old ulceration, that is, in the area of the distribution of the median nerve, not in that supplied by the radial.

April 20 the gangrenous area was considerably larger. The patient had had much pain and could not sleep well.

On April 21 I showed her to some of the members of the Society of Clinical Surgery, among whom were Dr. Murphy, of Chicago, Dr. Crile, of Cleveland, and Dr. Cushing, of Baltimore. All agreed that the disease was not Raynaud's disease, but no definite name could be given to the condition. It was thought that the ulcerations might be caused by some disturbance of the nerves controlling the local nutrition. Dr. Murphy suggested that stretching the brachial plexus might be of help. It is chiefly on account of Dr. Murphy's suggestion that I desire to record this case.

On April 22 the area was still enlarging and she was referred again to the main hospital. At this time the ulcer was about a square inch in extent. She was given hot and cold douches and massage of the arm.

On May 9 there had been slight improvement. The slough was less extensive. The ulcer was closing in. She was discharged to the Out-Patient Department. Within a few days the gangrenous area began to extend again and the black crust formed as before. The area of the ulceration since the excision of the radial nerve had extended towards the median distribution and only to a slight extent on the radial.

On May 15, the patient was again admitted to the hospital, and on May 16 I gave her ether, dissected out the median curve in the middle of the forearm and stretched it as much as I dared to do without breaking it. After this operation the patient had severe pain in the whole arm and also abdominal pain, and for some days an inability to pass her water. She had to be catheterized for nine days. There was also severe pain in the whole arm and shoulder requiring hypnotics.

She was again treated in the Out-Patient Depart-

ment without much improvement. There was great pain and the ulceration progressed considerably, attaining a larger size than it ever had before, also extending to the deeper tissues.

April 28, 1905. Two weeks after excision of radial nerve.

On June 24, it was noted that the ulcer was rapidly progressing in size. The dorsal tendon of the middle finger was exposed and sloughing. The red area extending $1\frac{1}{2}$ in. on the dorsum of the hand. She was treated with wet corrosive dressing.

On June 26, improvement began. On June 28, it was noted that the metacarpal bone was exposed. Improvement progressed rapidly until by July 29 the whole area was closed in.

On Aug. 4, to prevent recurrence and improve the circulation, Cushing's treatment for Raynaud's disease with hyperemia following the application of a tourniquet was begun.

On Aug. 11 all dressings and splints were removed and the patient was told to return in a week. There was no further note until Nov. 23, 1905, when she returned complaining that the hand was cold even in a glove.

Nov. 25, Cushing treatment continued. At this time it was noted that there was anesthesia over the radial area and diminished tactile and painful sensations over the median area.

Dec. 20, the patient has been using the tourniquet at home with some benefit to the circulation in the hand. There has been no ulceration since Aug. 1 and no pain since the end of September.

On Jan. 24, 1906, I showed her at the meeting of the Boston Medical Library at which Dr. Murphy read his paper on the "Surgery of the Nerves." The hand had then been entirely healed for six months.

In conclusion, I wish to apologize for the extremely unsatisfactory fragmentary character of the notes on this case. I can only say that it has been most difficult for me to bring the history into any sort of narrative form. The child has been a well-known character at the Massachusetts General Hospital, for her treatment has been some times undertaken by the surgical, sometimes by the medical, sometimes by the neurological and sometimes by the dermatological departments. The notes were taken by the assistants in these different departments at different times, and while they are very copious and cover a great deal of paper, they are disconnected and mainly devoted to the record of different forms of treatment.

Notwithstanding the numerous medicaments which have been applied, internally and externally, I do not feel that a résumé of them would add to the report. Perhaps the girl expressed it herself very well when she came to the hospital, saying that she had already been treated with many "salves, powders and other things."

Notwithstanding the fact that she has been a patient of nearly every department of the hospital, she has, most of the time, been under my observation, and I have followed her case with a great deal of interest.

While she was under the charge of the Dermatological Department, Dr. Bowen and his colleagues, Dr. C. J. White and Dr. H. P. Towle felt very strongly that the girl herself deliberately caused the lesions. They considered that they had proved this by maintaining the hand in a sealed dressing and they state that while the dressing was thus kept sealed, the ulcers always progressed favorably. There were other points which re-inforced this opinion. At times it seemed as if she deliberately evaded the truth in other matters. For instance, once on being told she was to go home the next day she told the nurse that she had taken the thermometer out herself. The thermometer registered 103°, but when the nurse took the temperature, it was normal. Also the fact that after the last operation she had retention of urine, although she was in no sense sick after the operation. Also her temperament was evidently neurotic.

In answer to these claims I can only say that in my opinion she was not untruthful or inclined to deceive and that the lesions were of such a strange character that they could not possibly have been produced by the girl herself. Such deep lesions produced in any ordinary way would also have led to suppuration and its accompanying inflammatory thickening and induration; on the contrary, the tissues about the lesions in this case were soft, seldom even slightly edematous and the line of demarkation was perfectly distinct.

It was also noted that whenever treatment was applied, whether the dressing was sealed or whether it was not, there was usually a point reached in the ulceration when it began to improve and continued to do so even to a point of being entirely healed. Another gangrenous area would then appear. The theory that she caused the lesions herself is also unable to explain the subjective and objective coldness of the hand and the extreme pain which the child suffered. There was a curious combination at times of great pain and local anesthesia, except on the ulcer itself, *i. e.*, there might be extreme pain in the arm, but the tissues even close to the lesion would be free from inflammation and tenderness.

As to treatment it can only be said that the final healing took place while she was having local dressings of weak corrosive solution. That this was not the entire reason for the healing I am convinced, because she had repeatedly had similar treatment, but without great improvement. However, during the time that it

finally healed these dressings were applied more continuously and faithfully by an especially skillful assistant. Whether or not the excision of the radial and stretching of the median nerve had any effect in bringing about the final cure, I do not feel certain. I am inclined to think that these operations were the cause of the final healing, but I by no means regard it as proved. Certainly, after the stretching of the median there followed the worst attack of ulceration which the patient had had; when this had reached its height, it rapidly subsided and has not since reappeared. I may also remark for the benefit of those who might attribute the cure to suggestion that Dr. Murphy spoke with great emphasis, in the presence of the girl, of the good to be obtained by nerve stretching.

AN ABDOMINAL INJURY.

BY C. A. ATWOOD, M.D.,

Surgeon to Morton Hospital, Taunton, Mass.

J. C., aged sixty years, driver of fire engine.

Never had any serious injury or illness until February, 1905. As he was drawing hose wagon into fire station some bystanders suddenly shoved the carriage, the pole of which struck J. C. a violent blow in the lower part of his abdomen. He felt faint and sat down for a few minutes, but soon resumed his work. Later he felt more or less pain and his abdomen became hard and sensitive. In May, 1905, as he was driving to a fire he experienced sudden relief from pain and distention. He returned to his home and found his underclothing soaked with dark-colored fluid which poured from his umbilicus. He continued his work as driver every day.

About the latter part of August there was still some discharge from the umbilicus and increased pain and tenderness in the right lower abdominal quadrant. This condition became so aggravated that he took to his bed. I first saw him Sept. 3, 1905. At the time there was a slight purulent discharge without odor from the umbilicus, the lower right quadrant of the abdomen was occupied by a hard resisting mass, the right spermatic cord was enlarged and tender. Pressure on the mass caused pus to flow from the umbilicus. A diagnosis of abdominal abscess was made and an operation advised.

Operation at Morton Hospital Sept. 8, 1905. Patient prepared as for a laparotomy. Incision under ether made into the center of mass in the lower right abdomen. Dense mass of inflammatory tissue cut through. No free fluid found. As the patient had a poor heart and the danger of infecting the whole abdominal cavity seemed imminent a gauze wick for drainage was inserted and dressing applied. Fistula continued to discharge, the hardness and tenderness not so great. Sept. 20, 1905, wound closed. Gave ether again, a long director was put into the fistulous opening in the umbilicus and laid open for several inches. On inserting the finger a hard mass could be felt deeply imbedded in the abdominal wall and nearly four inches from the umbilicus in the sheath of the rectus muscle; by means of a forceps two hard, rounded concretions about the size of horse chestnuts were removed, the wound was partially closed and gauze packing used; for several days there was a fecal discharge from the wound which was dressed. This discharge entirely ceased, the wound and fistula have completely closed, there is no hernial protrusion and