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THE TEXAS SCREW-WORM AND ITS INVASION OF THE NASAL CAVITIES.

BY M. A. GOLDSTEIN, M.D., ST. LOUIS.

Considerable interest has been manifested of late by the publication of a number of reports of cases from different sections of the country, describing the invasion of the human tissues, especially the nasal mucosa, by the larvæ or maggots of various species of fly.

Of the insects, whose larvæ have most frequently been described as attacking and infesting the human, may be mentioned those of the common blow fly, *Calliphora Vomitoria*, and especially those of the so-called Texas screw-worm, *Comptosmyia (Lucillia) Macellaria*.

Entomologists and scientific observers have traced the first habitat of the *Comptosmyia (Lucillia) Macellaria* to Mexico and South America. However, Dr. Williston, of Yale College, now writes that "it occurs everywhere from Canada to Patagonia."

Its centralization in North America seems to have been in the State of Texas, and from its common occurrence there, its frequent ravages among cattle, and its occasional invasion of the human family, together with the morphology of the larvæ, it has received the appellation of *Texas Screw-Worm Fly*.

Its effects were never seriously felt outside of Texas until the season of 1890. About this time the presence of this insect pest was reported from several localities in its ravages among cattle.

While this insect invader carries on its greatest work of destruction among cattle, it is of utmost importance for our rhinologists and aurists to be sufficiently conversant with the science of entomology to know that this pest will occasionally attack the human family, and several deaths have been recorded as the result of its invasion. Suffice it to say that the cavities of the head, especially those of the nose and ear, are usually the seat of invasion; this is more likely to occur when there exists a foul-smelling otorrhœa or ozœna. "It is one of the main characteristics of this fly that it is readily attracted by the odor of decaying animal and vegetable matter, and feeds very voraciously upon these until satisfied."

Observations and experiments have been made to establish the fact that the screw-worm fly will deposit her eggs upon decaying animal and vegetable matter, and that the maggots will thrive and mature in this substance.

In December, 1891, I instituted a series of personal investigations in a case of this character, which was placed in my charge at St. John's Hospital, of St. Louis.

As this case and the accompanying notes have never been published, I find this an opportune occasion for presenting the article:

A French farm laborer, æt. fifty years, a resident of East St. Louis, applied at the clinic for the relief of sudden and acute nasal pain. He gave the following brief account of the trouble: For several nights previous he had been sleeping in a hammock or on a bench in the open air, in the vicinity of a stock farm, to escape the intense summer's heat. During the last night he was awakened by a tickling sensation and buzzing in his nose, and on applying his hand, thought that he brushed away a large fly. There being no further disturbance, he continued his slumbers. On awaking the next morning there was a feeling of fullness in the nose, for which the patient could not account. For about five years he had had a chronic nasal catarrh, and considerable odor and discharge had been noted of late. From the details related, I also concluded that the nasal trouble was of a specific character, and that some necrosis of the nasal tissues must have taken place.

On examination, under reflected light, the entire left cavity of the nose was seen filled with a dense, light yellow mass. On removal of some of this for closer inspection, its composition was readily detected as that of a mass of eggs of some insect, later deter-

mined as those of the *Compsonyia* (*Lucillia*) *Macellaria*. Having some slight knowledge of the science of entomology, the serious nature of the case was recognized without delay, and steps were taken for the immediate removal of this mass of ova from the nose. With a blunt curette every visible portion of eggs was removed. Syringing or washing of the nasal cavities was avoided, as it was feared the force of the current might carry some of the eggs higher up into the nasal spaces. An actual count of the mass of ova removed showed the presence of over 500 single eggs. A careful inspection, after a thorough cleansing of the cavities, revealed a clear naris and it was supposed that the trouble had been eradicated. Extra precautions were taken, however, by advising the patient to use an antiseptic spray repeatedly.

Forty-eight hours later the patient again presented himself at the clinic; this time with his nose in a violent state of acute inflammation, complaining of excruciating pain, entire occlusion of nasal respiration and a sensation of "something moving" high up in the nasal cavity. Inspection revealed an intense infiltration of the mucous tissues, and an examination of the deeper areas of the nose was thus made impossible. After considerable difficulty, a small pledget of cotton, saturated in ten per cent. cocaine, was inserted. On second inspection, a group of round, glistening bodies, exhibiting some slight movement, were noticed deeply imbedded in the nasal mucosa. These were soon determined to be the ends of the recently developed screw-worms. As many of these as could be seen were removed with a mouse-tooth forceps. Dating from the history of the case, these maggots were about three days old, measured nearly one-half inch in length, and, judging from the life history of these larvæ, were about half matured. A point, worthy of notice, was the tenacity with which this larva clung to the mucous membrane when attempting removal with the forceps. It was feared that a number of these maggots had crawled beyond the reach of the instruments and had possibly found their way into the frontal sinus.

The patient was from this time on kept under almost constant observation at St. John's Hospital. In repeated sittings throughout the day, as soon as a maggot crawled into sight, it was seized with the forceps and removed. From day to day, the increase in the size of the larvæ was apparent.

Four days after the invasion of the host, the most serious aspect of the case developed. The nose and the surrounding areas of the face were swollen to an intense degree, the outer tissues red and infiltrated, the patient suffering fearful pain. In addition to this array of symptoms, facial erysipelas was threatened.

The region of the frontal sinuses showed the same glazed and swollen condition of the skin and the patient complained of the most intense pain in this area.

The ears were also involved through an extension of the inflammation through the posterior nares to the orifices of the Eustachian tubes. The patient had a temperature and pulse resembling that of septic fever.

The odor was exceedingly foul; there was complete nasal occlusion; the pharynx was swollen; palate and uvula œdematous. A number of the maggots found their way to the posterior nares and were "hawked" out by the patient.

On the sixth day, a point of fluctuation was observed in the greatly swollen skin of the dorsum of the nose, at about its center. A free incision was made, and a quantity of foul-smelling pus escaped. After the pus had been washed away, three fully-developed, live screw-worms were removed with the forceps. Examination with the probe revealed a communication with the nasal passages, which had been made by the boring of the maggots. A free drainage was now established, and the involved area was henceforth under better control. Potassium permanganate and two per cent. carbolic acid solution were the irrigating fluids used. During the next two days, twelve full-grown screw-worms were removed from time to time, some through the nares, and several from the outer wound. The nose was irrigated every three or four hours.

There was considerable suppuration and some sloughing of the mucous tissues which had been invaded.

The swelling, a fever and inflammatory reaction gradually subsided, and in three weeks the patient was discharged from the hospital.

It is interesting to note that the olfactory function, which had been completely held in abeyance, was fully restored and with the exception of a profuse discharge and sensitiveness of the entire nasal respiratory tract, for which patient was treated about two months, no further difficulties were observed.

Every antiseptic at command was tried, with the object in view of stupifying or killing the larvæ, but apparently without avail.

Antiseptics and germicides, which might have been efficacious in destroying the maggots, were scarcely found applicable, as the delicate tissues of the nasal cavities could not tolerate them.

In the disposal of the living maggots which I extracted with the forceps, it occurred to me to investigate the efficacy of the various remedies used for the destruction of the screw-worm.

The bulletins of the Louisiana and Texas State Experiment Stations (Department of Agriculture) on this subject are complete in every detail, yet the remedies which are described in the bulletins as being of value in the destruction of the screw-worm in cattle (chloroform, ether, carbolic acid, bichloride of mercury, turpentine, etc.,) were irritants and caustics of too powerful and destructive character to be used on the human mucosa.

I have tried all the enumerated materials, and my experiments scarcely tally with those of the bulletins.

For example, I have found the fully-matured maggot to live for four minutes in pure carbolic acid; in strong turpentine, for fifteen minutes. Chloroform has proved most satisfactory, as an exposure of thirty seconds to the atomized vapor invariably killed the worm. My observations in this direction were published in *Insect Life*, Vol. iv., Nos. 7 and 8 (U. S. Department Agriculture, Division of Entomology), in correspondence dated Dec. 13, 1891.

For the destruction of the screw-worm two factors must be taken into consideration: (1) The stupefaction or death of the worm. (2) The effect upon the wound that the agents necessary to destroy the maggot would have.

Of course, it is unnecessary to add that it is impossible to apply the powerful chemicals here enumerated, in the pure form, in the delicate areas of the nasal or aural cavities; again, in a diluted form, such remedies would fail to destroy a maggot of such wonderful vitality.

To demonstrate the vitality of the screw-worm, I may add that they crawled for several minutes over a surface strewn to the depth of one-eighth inch with pure calomel.

By actual count, over three hundred individual larvæ were removed in this case. This includes the large masses of small maggots removed in bunches with the curette and the fully-matured screw-worms removed singly or in small numbers by chloroform, the forceps, and the hawking and blowing efforts of the patient.

About fifty of the full-grown larvæ were kept alive and under observation. Many of these were used for experimentation, and some were observed as they assumed the pupa or chrysalis condition.

The fully-matured larva or maggot is three-fourths of an inch in length and about one-eighth inch in diameter. The body, of a creamy-white color, is made up of segments, while between each segment is a ring of bristles which causes the maggots to resemble a screw, and from this its name is derived.

To complete the sketch, the accompanying illustrations are added, showing the *Comptosmia* (*Lucilia*) *Macellaria* in its various stages.

Fig. 1.

Fig. 3.

Fig. 2.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 1—Single egg, greatly enlarged. Fig. 2—Bunch of Eggs. Fig. 3—Larva ("Screw-Worm"). Fig. 4—Pupa, or Chrysalis. Fig. 5—Pupa-case, showing broken end where fly emerged. Fig. 6—Screw-Worm Fly, wings expanded.

(The illustrations have been taken from photo-engravings published in the bulletin of the Texas Agriculture Experiment Station, 1890.)