MOLLUSCUM CONTAGIOSUM

REPORT OF AN INSTITUTIONAL EPIDEMIC OF FIFTY-NINE CASES*

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PHILADELPHIA

The term "molluscum" ("molluscis") was first used as descriptive of a dermatologic condition by Ludwig,[1] in 1739. The word was probably intended as a synonym for "mollis," describing certain soft tumors. Alibert,[2] Biett,[3] Cazenave[4] and Schedel,[5] on the contrary, attribute the origin of the term, used by Bateman,[6] to some resemblance existing between the cutaneous tumors and the knots on the bark of the maple. The disease was first described by Bateman in 1817, who gave a very good clinical description. The nomenclature of dermatology in the earlier days of this science of medicine was exceedingly chaotic. Several cases were reported as molluscum contagiosum shortly after Bateman's communication, but the most of these were, probably, fibroma molluscum. Alibert treated of molluscum contagiosum under the name of "mycosis fungoides." Bazin[7] described the disease under the term of "acne varioliformis." Erasmus Wilson[8] wrote of the condition under the heading of small sebaceous tumors. Duhring,[9] in 1881, used the title of "molluscum sebaceum." Unna in his book, "The Histopathology of the Diseases of the Skin," called the disease "epithelioma contagiosum." The terms employed by the various writers on this subject show the extensive and diverse titles used as descriptive of the condition.

Ever since this disease was first described the contagiousness has been discussed; Stelwagon's excellent paper[10] on the subject, in which are enumerated all the household and institutional epidemics on record, speaks strongly in favor of the contagious theory. Household and family epidemics will not be mentioned in this paper, but all of the institutional cases that have been obtainable will be described in some detail.

INSTITUTIONAL EPIDEMICS ALREADY RECORDED

Caillault's Cases.[11]—A girl, aged 8, was admitted to a hospital ward, with numerous tumors on the face, the eyelids and the shoulders. Fourteen out of the thirty children in the same ward finally became affected.

Ebert's Cases.[12]—A girl, aged 14, was admitted to a hospital with tumors on the face. The disease spread to three children who occupied the nearest beds and who came in contact with the patient and each other.

Liveing's Cases.[13]—Nine cases were observed in a school. A few months after the first case was noticed, the eight other patients were attacked.

Mittendorf's Cases.[14]—An epidemic was seen at a home for children. The disease was introduced by a little girl; an attendant noticed lesions on the eyelids at the time of her admission. A few weeks later several of the other girls developed similar lesions. Three months after the arrival of the first patient at the home, twenty-seven children had the disease. Another epidemic was observed at a nursery and hospital for children. Forty-one of the children were attacked within two years after the first case had been noted.

Jackson's Cases.[15]—A small outbreak occurred in the children's pavilion of a hospital. A week after the first case came under observation, 2 others developed; a week later another appeared; and the next week 2 additional cases—6 in all.

Allen's Cases.[16]—A child, with a few typical lesions on the face, was admitted to an asylum. Forty-two children were attacked by the disease a few months after the first child entered the institution. Five new cases subsequently developed, making a total of forty-seven. Another epidemic was described by Allen, also in a children's hospital. A little girl was brought in with a few characteristic tumors on the face; a boy playmate soon developed lesions of the same type; five other children were attacked by the disease.

Stelwagon's Cases.[10]—The first series, consisting of four cases, was seen in a children's hospital. The disease was discovered in one of the crippled infants, and a short time afterward three other patients, in the same ward, were attacked. The second epidemic occurred in a home for children; there were thirteen cases in all among about a hundred children. The third outbreak was noted in the last-named institution about a year later, the former patients having been cured. It consisted of twelve cases.

Tommasoli's Cases.[17]—This epidemic consisted of fifty-six cases in a children's asylum in the city of Sienna.

Graham's Cases.[18]—A little girl was brought to a home for infants with mollusca on the face. Two months later four children developed the disease. The lesions continued to appear on the other children; in four years' time fifteen cases were noted.

AUTHOR'S CASES

During the last year 59 cases of molluscum contagiosum have been seen in St. Vincent's Home out of about 350 children.

Sex.—Thirty of the patients were girls and the other twenty-nine were boys.

Age.—Five of the cases occurred at 7 years of age; 7 at 6 years; 11 at 5 years; 18 at 4 years; 14 at 3 years; and the 4 remaining cases at the age of 2 years.

Location of Lesions.—More than one area was involved in 27 of the cases. The eyelids were attacked in 22 cases; the chin in 16; the cheeks, right, left or both were involved in 11 cases; the forehead was the area of predilection in 11; the nose in 9; the cutaneous surface of the lip in 5 cases; the neck, anterior surface, in 5; the posterior surface of the neck in 3 cases; the left ear in 2; the dorsal surface of the right hand in 4 cases; the middle of the back in 1 case; and in 1 case, the left thigh was the site of attack. In 1 case, the vermilion border of the lower lip was involved by two small, pinhead-sized lesions. Two of the patients reported by Allen also had mollusca on the mucous membrane of the lip. A severe conjunctivitis was produced in one of the cases by a molluscum on the edge of the eyelid causing friction. Similar instances have been reported by Steffen[19] and also by Muetze.[20]

Number of Lesions.—One lesion was present in 19 of the cases; two in 12 cases; three also in 12 cases; four mollusca in 4 cases; five lesions in 2 other cases; six in 4 cases; 1 patient had seven lesions; and in 5 children there were, on each, twelve mollusca. The lesions were mostly from small to large pinhead in size; one molluscum was, however, pedunculated and cherry-size.

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1. Ludwig: Quoted by Erasmus Wilson, p. 301.
2. Alibert: Quoted by Erasmus Wilson, Diseases of the Skin, 1842, p. 309.
3. Blett: Quoted by Erasmus Wilson.
4. Cazenave: Quoted by Erasmus Wilson.
5. Schedel: Quoted by Erasmus Wilson.
6. Bateman: Delineations of Cutaneous Diseases, 1817.
7. Bazin: Quoted by Pye-Smith, Diseases of the Skin, 1893.
8. Wilson, Erasmus: Diseases of the Skin, 1842, p. 301.
9. Duhring: Diseases of the Skin, ed. 2, 1881, p. 121.
10. Stelwagon: The Question of the Contagiousness of Molluscum Contagiosum, Jour. Cutan. and Genito-Urin. Dis., 1895, p. 50; 1889, p. 60.
11. Caillault: Traité pratique des maladies de la peau chez les enfants, Paris, 1859, p. 94.
12. Ebert: Jahrb. f. Kinderh., 1870, iii, 152.
13. Liveing: Lancet, London, 1878, ii, 495.
14. Mittendorf: Quoted by Stelwagon, Jour. Cutan. and Genito-Urin. Dis., 1895, p. 52.
15. Jackson: Jour. Cutan. and Genito-Urin. Dis., 1891, p. 338.
16. Allen: Jour. Cutan. and Genito-Urin. Dis., 1886, p. 239.
17. Tommasoli: Quoted by Stelwagon, Jour. Cutan. and Genito-Urin. Dis., 1895, p. 50.
18. Graham: Jour. Cutan. and Genito-Urin. Dis., 1892, p. 89.
19. Steffen: Klin. Monatsbl. f. Augenh., 1895, p. 457.
20. Muetze: Arch. f. Augenh., 1896, xxxiii, 302.

EXPERIMENTAL INOCULATION

Whenever the opportunity offers experimental inoculation should be tried, in order to determine, if possible, the incubation period of the disease. Several authors (Retzius,[21] Paterson,[22] Vidal,[23] Stanziale,[24] Pick,[25] Haab,[26] and Nobel[27]) have reported favorable results. Several others (Stelwagon,[10] Allen[16]) have been unsuccessful in the attempt.

Retzius reported a successful inoculation on himself. A small quantity of the molluscum material was rubbed into the upper chest; this area was protected by a watch-glass. A pinhead-sized lesion appeared four to five months after this experiment; the growth progressively increased in size during the next three months. The lesion then gradually disappeared. Microscopic examinations of the pressed-out contents were corroborative of the clinical diagnosis.

Paterson, after several attempts, finally succeeded. The contents of the tumor were inserted into the follicles, in a tender part of the skin; such as the angles of the mouth, axillæ, mammæ, etc.

Vidal recorded a successful result, Pantry, one of his assistants, performing the experiment. A positive result was determined in three months.

Stanziale's experimental inoculation also had a successful termination. The substance of the molluscum was rubbed into the sound skin of the inner surface of the arm and forearm; three months later a hempseed-sized lesion developed. Forty days later this tumor had become pea-sized.

Pick, of Prague, was extremely successful in his experiments; nine out of twelve inoculations succeeded. The skin over Scarpa's triangle, in a boy of 11 and a girl of 9, was used in the inoculation. The twelve inoculations were made just within the epidermis. The lesions did not begin to develop until the tenth week; two weeks afterward they were excised, and were found to correspond microscopically with molluscum.

Haab succeeded in inoculating himself, after rubbing the contents of a freshly extirpated lesion into the skin of the forearm. Nothing was noticed for six months, when a characteristic hempseed-sized lesion developed, resembling, clinically and microscopically, a typical molluscum growth.

Nobel's reported favorable result was performed on a patient already attacked by the disease, one of the lesions on the patient acting as the inoculating material. Characteristic lesions did not develop for nine weeks.

Inoculation experiments were attempted in two children, each aged 4, the one a boy and the other a girl. These two children had not been exposed to the disease. In the first case the inoculation was made on Nov. 8, 1908; a small area on the right upper arm was excoriated by a scalpel until oozing of lymph occurred; the contents of a molluscum from one of the affected patients was then rubbed in, antiseptic precautions being observed. Five weeks later a small, conical, yellowish, elevated lesion was noted in the inoculated area; this lesion looked typical of a beginning molluscum. In a few weeks' time, however, the lesion dried up and disappeared. No other phenomenon has occurred in this area.

The second subject was inoculated on Nov. 24, 1908. Two small areas were abraded on the outer surface of the upper arm; the contents of the molluscum was rubbed into one of these; a few drops of a sterile salt solution mixed with some of the contents of a molluscum lesion was rubbed into the other. Unfortunately the arm became somewhat infected and the result has been absolutely negative. The areas inoculated were covered by vaccination shields. The incubation period of the disease can not be stated because the successful results so far obtained have varied between a few weeks and many months. The incubation period, from the time of admission of a child into the home until the disease was acquired, was approximately, in several cases, a year and one-half.

PATHOLOGY

The microscopic picture of the pathologic changes that occur in this disease is quite characteristic, with the lobulated appearance, the fibrous capsule, and the diagnostic molluscum bodies. The origin of the growth, and particularly the molluscum bodies, has been, and still is, a much discussed and unsettled question. The subject has been so fully described in the excellent paper[28] of C. J. White and W. H. Robey, Jr., that only a few of the important points will be emphasized here.

Engel,[29] in 1844, regarded the tumor as an enlarged sebaceous gland; Rokintansky,[30] and also Hebra,[31] some years later, agreed with Engel. In 1865 Virchow[32] stated that the new growth was a lobulated, glandular epithelioma arising from the hair follicle. Retzius stated that the tumor did not rise from the hair follicle, but owed its origin entirely to the epidermis. Boeck[33] denied the sebaceous origin of the new growth, because fat could not be detected in its cells.

White considered that the source of the growth was the rete layer. Crocker[34] believed in the follicular origin of the tumor. Benda[35] stated that in some cases the tumor arose in the hair follicle. Caspary[36] believed that the tumor had its origin in the rete cells. Patterson, in 1841, was the first to mention the so-called molluscum corpuscles or bodies. MacCallum[37] limits the term "molluscum corpuscle" to the peculiar body inside of the epithelial cell. Kaposi[38] beieved that the peculiar molluscum bodies arose from the transformation of cell protoplasm. Vidal inferred from the jelly-like translucency of the bodies that they were the product of a colloid degeneration. Geber[39] sketched the evolution from the rete cells. Unna[40] believed that the bodies were only the result of colloid or hyaline degeneration of the prickle cells.

C. J. White, in the most elaborate paper written recently on this subject, considers that the bodies are simply keratin, identical with the horny layer, except in the shape of the individual cells. He states that the growth arises from the rete, and that there is an extraordinary metamorphosis of rete cells into normal keratin. Several biopsies were made in these cases; the microscope proved the clinical diagnosis.

21. Retzius: Deutsch. Klin., 1872, p. 39; 1871, No. 50.
22. Paterson (quoted in Duckworth's paper, St. Bartholomew's Hosp. Rep., 1872, viii, 64): Edinburgh Med. and Surg. Jour., 1841, p. 280.
23. Vidal: Progrès méd., 1878, p. 478.
24. Stanziale: Gior. internaz. d. sc. med., 1890, p. 321.
25. Pick: Monatsh. f. prakt. Dermat., 1892, xv, 133.
26. Haab: Correspondenzblatt für Aerzte, No. 8, 1886; quoted from article by Stelwagon, Note 10.
27. Nobel: Arch. f. Dermat. u. Syph., 1893, p. 929.
28. White, C. J., and Robey, W. H., Jr.: Jour. Med. Research, 1902, new series, ii, 255.
29. Engel: Ztschr. d. k. k. Gesellsch. d. Aerzte zu Wien, 1844.
30. Rokintansky: Pathologische Anatomie, 1856, p. 79.
31. Hebra: Lehrbuch der Hautkrankheiten, 1872.
32. Virchow: Berl. klin. Wchnschr., 1865, p. 34.
33. Boeck: Vrtljsch. f. Dermat. u. Syph., 1875, p. 23.
34. Crocker: Diseases of the Skin, 1893, p. 479.
35. Benda: Ztschr. f. Dermat., 1895, p. 195.
36. Caspary: Vrtljschr. f. Dermat. u. Syph., 1882, p. 205.
37. MacCallum: Jour. Cutan. and Genito-Urin. Dis., 1892, p. 93.
38. Kaposi: Vrtljschr. f. Dermat. u. Syph., 1877, p. 333.
39. Geber: Vrtljschr. f. Dermat. u. Syph., 1882, p. 403.
40. Unna: The Histopathology of the Diseases of the Skin, transl. by Walker, 1896, p. 795.

BACTERIOLOGY AND CULTURAL EXPERIMENTS

Angelucci,[41] in 1881, described a bacterium, the *Bacterium lepogenum,* which, he maintained, was the cause of the tumor. Neisser,[42] in 1882, denied this and put forward the theory that the cause of the tumor was a gregarin and asserted that the peculiar bodies were the shells of these organisms. Graham[18] stated that he had found a micrococcus in his cases, which grew on potato and in bouillon, produced fermentation in milk, and was stained by Gram and Gabbet's methods. Robey, after extensive cultural experiments, came to the conclusion that the organism found was the *Staphylococcus epidermidis albus* of Welch, the normal inhabitant of the deeper layers of the skin.

Cultural experiments were made in these cases and two organisms were found. The first was a non-motile bacterium, size 0.5 to 1.0 by 1.0 to 2.0 microns, aerobic and facultative anaerobic. It grows abundantly at either room temperature or at 37.5 centigrade. It was negative to the Gram test. All of the differential tests were carried out and the organism was classed as the *Bacterium aerogenes.* The organism was probably present because of some slight contamination at the time of making the molluscum cultures. The second was a round, slightly oval coccus, divided in all planes, about 0.8 microns in diameter; Gram's method gave a positive result. Careful experiments were carried out on all culture media, and numerous tests were employed to determine the proper classification. This organism apparently is the *Micrococcus salivarius;* it was isolated by Biondi from the saliva. It resembles markedly the *Micrococcus epidermidis albus,* but differs from it in one chief way, in its activity regarding gelatin; the *Micrococcus albus* liquefies it in about two to three days, the *salivarius* not at all. These two organisms resemble each other so closely that it is only fair to suppose that they are in some way related; possibly two forms of the same micrococcus.

It is to be hoped that the etiologic factors of the disease will be elucidated, and that the pathologic origin of the growth and of the so-called molluscum bodies will be positively determined.

SUMMARY

Molloscum contagiosum usually attacks the face, in a great majority of the cases on, or in close proximity to, the eyelids Children are more susceptible to the disease than adults.

It is very difficult to explain the present or other epidemics on any other theory except that the disease is contagious.

The cause of the disease is, unfortunately, still to be determined; although a micro-organism, usually a coccus, has been found in a few cases.

The incubation period is undetermined; from the experiments so far carried out, from a few weeks to many months.

The skin apparently does not have to be broken for the infection to occur, but this point is still undecided.

In closing I wish to express my thanks to Dr. Thomas Cope, pathologist to the St. Vincent's Home, for the careful cultural experiments; to Dr. C. Y. White, former pathologist to the home, for pathologic sections, and to Dr. Kolmer, resident physician in the same institution, for inoculation tests.

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41. Angelucci: Internat. Med. Congress, 1881.
42. Neisser: Monatsh. f. prakt. Dermat., March, 1882

ABSTRACT OF DISCUSSION

DR. GEORGE PERNET, London, Eng.: One point not mentioned is that molluscum contagiosum may be found in certain birds, such as pigeons and buntings. In one instance two women contracted the disease from a pet pigeon. One case was in the practice of an ophthalmologist, and was recorded by him. The patient was in the habit of fondling the pigeon, and suffered much from the disease, especially about the eyelids. Since that time, when these patients come to me, I always inquire whether they have handled birds of this sort. I find that curetting the lesions with a sharp fenestrated curette is one of the readiest methods of getting rid of them, instead of splitting them up.

DR. LOUIS A. DUHRING, Philadelphia: The photographs that I saw did not show the usual formation of the tumors, in that there was no distinctly defined umbilication. It is well known that this umbilication is not always manifest, and apparently it was absent in some of these tumors. I have seen cases of this disease for many years in my own city and elsewhere, and I am always on the lookout for it in the hospitals with which I am connected, but I have found that it is a rare disease outside of asylums and institutions. Notwithstanding the facts relating to contagion, I have never been convinced of the contagiousness of the disease, and the many experiments that have been made still seem to leave that an open question. Its epidemic character is, of course, to be recognized, especially in institutions. The treatment of molluscum contagiosum may be made extremely simple. Perhaps the easiest method is to touch the lesions with a drop of acetic or trichloracetic acid, or to incise and express the contents.

The pathology of this affection, as described by Dr Knowles, is in accord with the studies that have been reported by Dr. White of Boston. I could never see that the disease was parasitic, rather it seemed to be due to elaborate changes in the epidermis, which have been so well described by Dr. White and by others. The affection has also been observed in birds and certain animals.

I think that records of epidemics of the kind narrated should be reported, and in the course of time we shall have much valuable material from which to draw conclusions. The question of the possible contagious character of the disease is one of importance, and one about which we ought to express ourselves if we have had any experience touching on that subject.

DR. MARCUS HAASE, Memphis: I recall one case in an English boy, 19 years old, who had a linear group of three lesions on the anterior aspect of one leg. Having had my attention called to the fact that this disease might be transmitted through birds, I questioned him along that line, but he said he had never handled birds.

DR. WILLIAM A. PUSEY, Chicago: As a student, I was taught to expect molluscom contagiosum as a common affection, but I have found it rare. I certainly see in Chicago ten cases of blastomycosis, for example, to one case of molluscum contagiosum.

DR. F. C. KNOWLES, Philadelphia: In regard to the occurrence of this affection in birds, and various other phases of the subject, I did not take the time to refer to them, as the literature is very extensive, and I had to stick to the subject under discussion. In the pictures that I passed around, it was my endeavor to bring out the umbilication of the lesions. Most of the lesions were absolutely typical in every way, including the umbilication.

St. Vincent's Home, where the epidemic reported by Dr. Stelwagon occurred, is a sister institution to the one referred to in my paper, and the children are sent there as they grow older. It was apparently a continuation of the same epidemic. As a rule, I see about ten or fifteen of these cases every year in the hospitals with which I am connected, but during the past year I have seen over 100 cases, including the 59 reported in this paper. In Dr. Hartzell's service at the University of Pennsylvania Hospital, I have had an opportunity of seeing, during the last few months, an epidemic of over 30 cases; the students in the college department were attacked. This is the largest number I have seen in one year.