TRICHOSTASIS SPINULOSA

EMORY LADANY, M.D.

Nobl (1) in 1913 reported six cases of a peculiar follicular disorder characterized by protruding plugs in groups of hair follicles which on microscopic examination proved to be bunches of lanugo hairs imbedded in a horny mass. He described the clinical and histologic features of this disease in great detail and gave it the name “Trichostasis spinulosa.”

Poschacher (2), reporting cases of this disorder in 1925, mentioned in his article the first known case which was presented by Franke (4) at a meeting of the Braunschweig Medical Society in 1901. Six years after this first presentation in 1907, Galewsky (3) showed a case in Dresden and later reported two more cases under the title “Keratosis spinulosa cum trichostasi.”

Franke (4) published a report in 1912 under the title “Das Pinselhaar, Thysanothrix,” adding two more new terms to the list of names given to this interesting entity. In 1913 followed the articles of Csillag (5) under the name “Lanugo Komedonen,” and of Weidenfeld (6) as “Ichthyosis Trysanotrichica.” In 1924 Gawalowsky (7) renamed the condition “Dysplasia pilorum thysanoformis.” Further cases were reported by Hochstetter (8), Schramek (9), Fuchs (10), Fruhwald (11), and Lenartowitz (12).

The first case mentioned in the American literature appeared in 1924. It was presented by Mitchell (13) at the Chicago Dermatological Society. Between the years 1932 and 1938 articles were published in this country by Burgess (14), Traub (15), Franburg (16), and Corson (17).

The total number of cases reported in the literature by the above named authors is approximately one hundred. In addition to these reported cases, Poschacher (2) mentioned forty additional cases which he saw later, Franburg (16) five cases, and Traub (15) eleven more cases, adding up to more than two hundred cases mentioned in the available literature.

REPORT OF CASES

1) J. K., 46 year old white female, seen June, 1953. For several years she noticed recurrent comedo-like protruding dots in great numbers on the cartilaginous part of her nose. She had no subjective complaints, but found the lesions cosmetically objectionable and occasionally visited a dermatologist to have them removed.

On examination she showed large numbers of dark spinulous plugs, some protruding over the surface, others lodged in the orifices of the follicles on the alae nasi and on the tip of the nose. There was a slight erythema present on these areas and her facial skin showed marked oiliness, with occasional comedones. The spinulous plugs were expressed from the involved follicles, and under the microscope they appeared as bunches of ten to thirty lanugo hairs held together by a keratinous mass. A resorcin-sulphur lotion was prescribed, with instructions to use soap and water instead of cosmetic oils. In October, 1953, reexamination showed only a few protruding plugs containing large numbers of lanugo hairs, besides some comedones containing none to six hairs each.

The follicles of the alae nasi were patulous, presenting the picture of a seborrhetic nose. There was no erythema present at this time.

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2) P. B., 57 year old white female, seen June, 1953. For the past six years she had complained of an itching nose, disfigured by a large number of "blackheads."

Examination showed a slightly seborrheic facial skin, erythema with slight scaling of the cartilaginous part of the nose and numerous black spinulous dots, some of which seemed to protrude over the orifice of the follicles of the alae nasi.

On expression and microscopic examination the black spinules showed the typical picture of trichostasis spinulosa. The follicles of the alae nasi were distended with gaping orifice and the patient had a dense growth of fine lanugo hair on these areas including the tip of the nose. The patient received five x-ray treatments of 54r. each, and a resorcin-sulphur lotion was prescribed. The follicular plugs were removed with a comedo extractor and the erythema cleared. The complaint of itching ceased completely.

3) C. L., 38 year old white female, seen July, 1953. She complained of itching red nose, red spots on the face, and itching, scaly scalp for the past three months. She had had a similar condition about a year earlier. Examination revealed a seborrheic dermatitis of the scalp, the face and the nose. On the alae nasi and on the tip of the nose there were many comedo-like plugs, some of which seemed to be raised over the orifices, others sitting deeper in the follicles.

To rule out possible contact dermatitis, patch tests were performed with her cosmetics with entirely negative results. The follicular plugs were removed. They showed dark brown keratinous masses each containing 7 to 33 lanugo hairs. A sulphur cream and Selsun suspension were prescribed for the scalp and a sulphur-resorcin lotion for the face. All her symptoms and her subjective complaints improved rapidly, including the cosmetic appearance of her nose.

4) J. R., 61 year old white female, seen July, 1953. Her presenting diagnosis was seborrheic keratosis of the face. As an incidental finding, excessive plugging of the nasal follicles was discovered, which upon microscopic examination proved to be the typical plugs of trichostasis spinulosa. The keratoses were removed but the patient did not desire any treatment for the "black dots" since they did not cause her any discomfort.

5) J. B., 45 year old white male, seen September, 1953. His complaint was "dandruff and red spots on the face." On examination a seborrheic dermatitis of the scalp and face was found. He also showed many comedo-like plugs on the nose which microscopically appeared
as bunches of 30 to 40 lanugo hairs in a horny sheath. He was given antiseborrheic therapy but refused treatment for the trichostasis of the nose.

6) C. P., 50 year old white female, seen October, 1953. She complained of an itching rash on the arms and face. The rash developed after exposure to dust and fumes from a heating unit and chimney which were cleaned in her presence. She presented a typical dermatitis of the exposed parts of her skin, which cleared in a week after using compresses and a simple lotion. On the cartilaginous part of her nose black comedo-like dots were present in disfiguring density. Examination of the expressed plugs disclosed trichostasis spinulosa. She did not desire any treatment for this condition as she had had it for several years without its causing her any discomfort.

7) F. Y., 23 year old colored female, seen October, 1953. She was found to have diffuse scaly erythematous rash of the face, neck and arms. Contact dermatitis, due to a hair straightener was diagnosed. As an incidental finding, several discrete hairs were seen on the cheeks, and the right ala nasi was covered with tiny black, spinulous plugs. On the left ala nasi there were some comedones, but no spinules. Several of the black plugs were removed which, under the microscope, presented the picture of the bunched lanugo hairs, imbedded in a horny mass of trichostasis spinulosa. Other plugs of the same area, as well as those from the left ala nasi showed only one or two lanugo hairs as seen in common comedones.
CLINICAL FEATURES

Trichostasis spinulosa is a peculiar disorder of the hair follicles. In the area of involvement they appear to contain spinulous dark plugs either protruding over the orifice of the follicles, or seen to be lodged in the orifices as small comedo-like dots. In some cases all the follicles of an affected area are plugged, in others normal appearing follicles are interspersed with those containing the horny spinules. There may be small lanugo hairs in great numbers arising from affected or normal follicles in or around the area involved. Expression of the 1–2 mm. plug leaves a patulous, horny orifice.

The plugs, flattened by gentle pressure, appear to be composed of tiny threads held together by a clear, greasy substance. The distal end of the plug is usually black, while the intrafollicular portion is lighter in color.

In most cases the condition does not give rise to any subjective complaint and may be noticed only as an incidental finding in cases of unrelated skin disorders. However, some patients show an erythema, or scaling, or they may complain of severe itching on the affected area, particularly if the affected area is on the face where seborrhoic dermatitis, or occasional contact dermatitis may be associated with, and may direct attention to, the usually symptomless trichostasis.

The common sites of this disorder were described by previous presentations on the intra-scapular area, chest, abdomen, arms, forehead, upper lip and the chin. Few authors reported involvement of the cartilaginous part of the nose. (Fuhs (10), Poschacher (2), Franburg (16), Traub (15), Csillag (5)).

Children do not seem to be affected. The only reference to the preadolescent age group found seems to be a case of Lenartowitz (12) who reported a nevoid lesion of a young man which, according to the patient, was present on the dorsum of his hand since childhood, a localization which has not been mentioned by any other author. Most cases reported were those of men past adolescence up to the seventh decade, whereas case reports of women were comparatively few. (Poschacher (2), Gawalsky (7), Traub (15), Franburg (16)).

The duration of this condition seems to vary from a few months to several decades but it is difficult to determine in most cases, as the patient may not know of its existence until it is discovered as an incidental finding on a more meticulous examination of the skin.

Most authors, reporting single or only a few cases, felt that it must be a rare condition. Others, having found a great number of their patients with this skin disorder once they were alerted to it, considered it a rather common affliction usually overlooked on routine skin examinations as the patient is rarely aware of it. Nobl (1) considered it a fairly common condition.

Galewsky (3) found only three cases in his practice but not a single case in 40,000 examined subjects. On the other hand Traub (15) discovered eleven cases in twelve patients selected at random.

Franburg (16) saw twelve cases in two months which he included in his article, but in a footnote mentioned the finding of fifty more patients with this anomaly in a few months. Similarly Poschacher (2) mentioned 46 more cases coming to his attention after the completion of his original case report.
Having seen seven cases in five months, all affecting the alae nasi, it seems to me that trichostasis spinulosa cannot be a rarity and probably more cases would come to our attention if one were on the lookout for them. Furthermore, since six of the seven cases involved females, it is suggested that trichostasis spinulosa may not be so predominantly a male affliction as most of the previous reports would seem to indicate.

PATHOLOGY

Microscopic examination of the plugs expressed by tweezers or comedo extractors reveal a mass consisting of ten to forty-five lanugo hairs which are quite uniform in size (1–2 mms.). The distal end of the individual hair is rounded and thinner than the shaft and the proximal end is bulbous. They are glued, bunched together by a horny mass, which contains no nuclei and does not extend to the distal or proximal ends of the hairs but leaves a portion of them uncovered at both ends. For the purpose of the microscopic examination the expressed plug should be picked up with the point of a small comedo lance and deposited on a glass slide. When covered with a glass it is ready for the low power lens. Potassium hydroxide dissolves the keratinous material and the hairs disperse on the slide, thereby losing their characteristic grouping and horny sheath.

The histologic features of the disease were described in detail by Nobl (1) and Hochstetter (8). The orifice of the follicle is distended and funnel shaped. The distended follicle is filled with a horny mass in which a number of lanugo hairs can be seen. There is acanthosis of the perifolicular epithelium with hyperkeratosis. The corium is normal without any inflammatory changes. Gawalowsky (7) reported some double follicles and double papillae but these did not seem to be consistent findings and were not seen by Nobl (1), Hochstetter (8) or other authors.

ETIOLOGY AND PATHOGENESIS

The etiology of this disease seems to be obscure and was interpreted differently by the various authors.

Nobl (1) and Franke (4) believed that congenital or acquired dystrophic disturbance of the hair papillae might account for the large number of lanugo hairs in the follicles. Galewsky (3) maintained that the congenital disturbance is a tendency for follicular hyperkeratosis which may be on a nevoid basis. Gawalowsky (7) came to the conclusion that the disease is a congenital dysplasia of the follicles; the papillae are formed in pairs, producing multiple hairs, which are not extruded, due to the lack of sebum and hasty keratosis of the follicles.

Similar opinions were held by Hochstetter (8), Burgess (14), Mitchell (13) and Sutton and Sutton (18), who all theorized on some congenital malformation of the follicles.

Werther (19) thought that trichostasis spinulosa is identical with nevus acneiformis.

Hochstetter (8) gave as an alternative theory the possibility that the retention of hairs in the follicles may be due to some acquired defect and not to any congenital dysplasia.
Poschacher (2) believed that as the disease is an extremely common one, congenital factors may be negligible; some external influences, such as dust, fats, oils, heat, may damage the follicles causing some hyperkeratosis and plugging, preventing the extrusion of the normal lanugo hairs. He found 20 cases in 200 examined workers of a locomotive plant, who were exposed daily to steel dust and machine oils.

Fuhs (10) was of similar opinion and suggested that industrial irritants might be mainly responsible for the keratotic plugging and hair retention.

COMMENT AND DISCUSSION

The findings of several authors (Nobl (1), Fuhs (10), Poschacher (2), Franburg (16), Traub (15)), strongly indicate that trichostasis spinulosa is a rather common condition.

The seven cases found in five months among my patients leads me to believe that this anomaly is not rare. Furthermore its predominance in the male sex is not likely, if one considers the evidence of finding six females in seven cases picked at random from a large number of office patients. Only two of these affected patients were aware of this anomaly, in the five remaining cases trichostasis was an incidental finding.

All seven patients were mature individuals ranging from 23 years to 61 years of age; 5 white females, 1 colored female and 1 white male. Fifty-five children of pre-adolescent age, picked at random, were examined for evidence of this condition during the same five month period with completely negative results.

With the exception of one questionable case described by Lenartowitz (12), all the cases collected from the available literature were in the post-adolescent age groups. Those authors who saw larger numbers of cases did not seem to find any significant differences in the incidence of the disease in males or females. (Gawalowsky (7), Poschacher (2), Traub (15), Franburg (16)). Should trichostasis spinulosa be due to congenital dysplasia or dystrophic disturbance of the hair follicles, if it should be a nevoid malformation of follicles or papillae, one certainly could expect at least some cases in the younger age groups. The proponents of the congenital origin of this anomaly seem to be those authors who saw and reported a single to three cases and believed it to be a great rarity. The cases here reported did not seem to be nevoid in character and did not resemble in any way nevus acneiformis or nevus sebaceous.

The histologic picture of trichostasis does not show any remarkable features different from those seen in various follicular keratoses; it does not seem to be different from the histopathology of common comedones except maybe in the presence of several lanugo hairs in the keratotic plug filling the distended follicle.

Multiple hairs arising from the same composite papillae as discussed by Pinkus (21) could not account for the picture of trichostasis spinulosa. Multiple hairs arising from composite papillae were observed on the bearded area of the chin and on the scalp in only a few patients. The coarse hairs so found never numbered more than 2–7 in one follicle. They were not held together by a horny, comedolike mass but by a common root sheath and their removal was difficult and painful.
On the other hand the comedo-like plug of trichostasis is composed of large number of fine and discrete lanugo hairs held together by a horny substance and can be expressed with ease and without discomfort to the patient. They are found on the seborrheic areas of the face and nose rather frequently in both sexes. Pinkus himself is of the opinion that “Trichostasis Spinulosa probably is just an exaggeration of the normal cyclical activity of the papillae and results from the retention of the dead hairs in the hyperkeratotic follicle.”

The singular finding of the doubled papillae by Gavalowsky (7) was not found by other authors. But even if such double papillae could account for an increased lanugo hair production the simultaneous presence of 40 hairs in one follicle is still not explained by two papillae or even five, and unless one explained it by the retention of the formed lanugo hairs in the follicles for a longer period in which no extrusion of any hair occurs, while the papillae continue to form hairs at a normal or accelerated rate.

The obstacle to the extrusion of the detached lanugo hair may be found in the hyperkeratotic plugging of the follicles.

Such plugging and hyperkeratosis of the follicular apparatus may be brought about by internal causes such as endocrine, metabolic disturbances, Vitamin A deficiency and perhaps hyperactivity of the sebaceous glands; or external influences such as irritating soap, medication, cosmetic oils, paraffin-containing creams, dust, hydro-carbons, industrial oils, and prolonged exposures to extreme heat. These factors seem to be operative in the formation of common comedones. As trichostasis spinulosa is found mostly on areas where the sebaceous glands are well developed, which are also the sites of comedo formation, it may be assumed that there are at least some common factors in the etiology of these two conditions.

Indeed, on clinical inspection the two conditions may appear indistinguishable and often the spinulous protruding plugs of trichostasis are interspersed with simple comedones. It may also be noted that all seven cases were found in patients who had seborrheic skins, and revealed at least a few comedones in or adjacent to the area of trichostasis. The apparent absence of trichostasis spinulosa among the pre-adolescent age groups in which comedones are rarely seen may also be significant. The question arises therefore: Are there any significant similarities or differences between common comedones and trichostasis spinulosa?

As mentioned above the histopathologic picture of the two conditions is identical, except for the presence of a few hairs in some sections of trichostasis.

To investigate the common microscopic features of the expressed plugs obtained from comedo-containing follicles and from those of trichostasis, the following studies were made: From each of the seven reported cases, ten well-developed protruding plugs were obtained and the number of hairs contained in the horny mass counted. It was found that the number of hairs in these plugs varied from 3–42. In the same cases an attempt was made to collect comedones in or around the area of the spinulous plugs. The number of comedo plugs so obtained in each case varied from 3–10. Microscopic examination of these comedo plugs showed a horny mass entirely similar to that of trichostasis. Some of these horny plugs contained no hair but the majority showed one to five hairs.
For further study of the microscopic features of common comedones ten male and ten female patients were selected, all of whom showed some degree of seborrhea and comedones on the nose, but no protruding spinulous plugs as seen in the typical cases of trichostasis spinulosa.

From the alae nasi of each of these patients, ten comedones were obtained and placed on a slide for microscopical study; therefore 200 comedones in all were obtained from twenty patients. The hair counts in these comedones were as shown in Table I.

This study indicates that the presence of lanugo hairs in common comedones is a rule and not an exception. In a large percentage of the comedones there were more than one lanugo hair present. The number of hairs seemed to be at least in some degree connected with the age of the comedo. In free flowing transparent sebaceous plugs which contained no or few cellular, horny elements, none or only one hair could be discovered. In the harder dark-colored, transparent plugs which consisted mainly of compressed horny cells and debris, two to three hairs were more often found and in 16.5% of these horny, older comedones more than three hairs were counted. These comedo plugs containing more than three hairs presented exactly the same microscopic picture as those obtained from the cases of trichostasis spinulosa.

These findings point strongly to the common retention origin of the multiple lanugo hairs in the comedones as well as in trichostasis spinulosa. Evidently in both conditions the major factor is the horny barrier in the follicles and not some anomaly of the papillae.

A similar picture was found in the retention cysts of chloracne by Gans (20), in which the horny masses also contain bunches of lanugo hairs. In two of my reported cases, an abundance of fine lanugo hairs could be seen on the nose arising from normal follicles. This may suggest the additional possibility, at least in some of the cases that besides the retention phenomenon also hypertrichosis of the affected area may play a part. However in the remaining five cases no evidence for an excessive or increased rate of lanugo hair production could be found.

It seems to me therefore that trichostasis spinulosa is a variant of follicular retention cysts, notably of common comedones. In both conditions follicular hyperkeratosis and horny plugging play dominant parts. The causative agents may be external irritants or a variety of internal factors. While it is possible that in the pathogenesis of trichostasis spinulosa additional elements may be involved, there is no indication that congenital factors are of any importance in

### Table I

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<tr>
<th>LANUGO HAIR COUNT</th>
<th>NUMBER OF COMEDONES</th>
<th>PERCENTAGE OF COMEDONES</th>
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<tbody>
<tr>
<td>None</td>
<td>30</td>
<td>15%</td>
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<tr>
<td>I hair</td>
<td>80</td>
<td>40%</td>
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<tr>
<td>2-3 hairs</td>
<td>57</td>
<td>28.5%</td>
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<tr>
<td>3-10 hairs</td>
<td>21</td>
<td>10.5%</td>
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<tr>
<td>10 or more hairs</td>
<td>12</td>
<td>6%</td>
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its etiology. However, as the number of lanugo hairs is consistently high, forming the peculiar protruding spinules in trichostasis spinulosa, and such plugs are densely distributed on a plaque-like area, the clinical features are somewhat different from comedones and the condition should be considered an entity. The name "Trichostasis spinulosa" is now accepted in the American literature for this condition, though Csillag's term "Lanugo comedones" would be more appropriate.

SUMMARY

1. Seven cases of trichostasis spinulosa are reported.
2. The clinical features, pathology, and etiology of the disease are described.
3. The result of comparative studies of this condition and comedones are discussed.
4. A number of common features strongly suggest that trichostasis spinulosa is a variant of comedones though it has a sufficiently peculiar character to be considered an entity.

REFERENCES