

REFERENCES

1. Driver, R. L., Chappell, R. H., and Carmichael, E. B.: Effect of Hydrostatic Pressure on the Experimental Production of Ulcers. *Am. J. Dig. Dis.* This issue.
2. Driver, R. L., Chappell, R. H., and Carmichael, E. B.: Effect of Concentration of Pepsin and the Differential Susceptibility of Jejunal Segments in Experimental Jejunal Ulcers in the Dog. *Am. Jour. Dig. Dis.* This issue.
3. Lawson, H. and Chumley, J.: The Effect of Distention on Blood Flow Through the Intestine. *Am. Jour. Physiol.*, 1940, 131:368.
4. Oppenheimer, M. J. and Mann, F. C.: Intestinal Capillary Circulation during Distention. *Proc. Mayo Clinic*, 1942, 17:427.

---

## Pruritus Ani

By

GUY R. McCUTCHAN, M.D., F.A.C.P.  
PORTLAND, OREGON

THE tribulation induced by pruritus ani may be almost unendurable. Even in the mildest cases it causes nervousness, irritability and sleeplessness in addition to the local discomfort. More serious forms of the disorder may present the physician with a symptom complex so distressing to the patient that he would gladly tear away the skin of the affected parts if he could obtain relief by so doing.

The sensation of itching is noted so frequently by normal individuals that it is considered physiological. Ordinarily slight friction such as scratching or rubbing causes the sensation to disappear. However, itching becomes pathological when the sensation is annoying or persistent. The mechanism of pruritus is not altogether clear but it is quite likely that it is a form of hyperesthesia. The latter may be produced by the elaboration of a histamine-like substance from endogenous sources as in urticaria, or in response to foreign material from without as in parasitic infections (1) or chemical irritants as in contact dermatitis. Kaposi explained many years ago how scratching could intensify itching but more recently Sulzberger and Wolfe (2) have suggested that a toxin capable of causing skin irritation may be present in the blood, and that after scratching more toxic material is brought to the involved area by means of the increased circulation, occasioned by the trauma. Whether or not this irritating toxin is histamine or the so-called "H" substance has not been proved.

Pruritus ani is a regional type of inflammatory skin reaction, the nature of which is exceedingly complex. The involvement may be minimal and periodic in which instances the simplest measures suffice to bring relief, but often the skin changes are so severe that only through the ingenuity of the physician and perseverance of the patient can the successful control of symptoms be brought about. There is no general agreement as to the etiology of the condition or the most effective therapy. The very number of theories as to the cause and cure are ample testimony as to their inadequacy, but some of the underlying factors have been discussed at length by Stokes (3). He groups the varied etiological constituents of pruritus ani into five divisions

and it is informative to consider them separately.

### *Physiological Mechanism:*

The sweating apparatus of the anogenital area (apocrine glands) produces an excretion which has a higher pH than ordinary sweat (eccrine glands), contains protein, and excess carbohydrates. This type of secretion between two moist folds of skin furnishes an ideal culture medium for fungi and yeast organisms. The excess CHO normally found in the apocrine excretions may be further increased by a diet high in starches and sweets. Such foods, through the process of skin hydration, directly predispose to pyogenic and fungus infections, while alcoholic beverages exert a similar effect. It is further emphasized that a diet high in carbohydrates tends to encourage infection of intestinal contents thus promoting the growth of both fungus and pyogenic flora. The secretion of fat by the skin is a physiological defense mechanism but there is some reason to believe this function is minimal in pruritus ani. When sebaceous material is deficient the use of soap quickly removes the oily protective coat and leaves instead alkali which is not only irritating but probably causes a localized sensitivity to other substances such as metals (mercury, sulphur), drugs (salicylic acid, tars), allergens of a protein character, and presumably also to fungi, yeast and bacteria.

### *Infective Mechanism:*

In the preceding paragraph it has been revealed how physiological conditions may profoundly affect the character of the bacterial flora in and about the anal opening. The most common infective agents in this area are the fungi and they may be demonstrated in many cases by direct scrapings or culture. Castellani stated that "Pruritus ani is, as a rule, a form of latent epidermophytosis without the usual symptoms of an ordinary epidermophytosis being present."

Terrell and Terrell (4) believe that ninety per cent of all cases of pruritus ani are due to fungus infection. They feel, as do others, (1-6) that local pathological conditions such as fissures, fistulas and hemorrhoids have been overstressed as a cause of anal pruritus. The author has seldom noted permanent cures following surgical procedures such as excision of fissures, repair of fistulas or removal of hemorrhoids.

Terrell and Terrell (4) maintain that the pruritus

ani and vulvae so often encountered in diabetes is usually due to local fungus infection rather than the systemic condition. However, other investigators claim that in diabetes there is a direct relationship between pruritus and hyperglycemia. (5) I am in accord with the latter opinion because some of the most extensive cases of pruritus ani I have ever encountered have been in patients with uncontrolled diabetes. They have uniformly improved with proper management of the diabetes, often without any local treatment whatever. This may be due to a reduction in CHO of the diet, as well as control of the glycosuria, but pruritus ani in diabetes may certainly be due to the systemic disturbance alone and demonstrations of fungi in the lesions by no means disproves this contention.

Sutton (6) also thinks that pruritus ani is more commonly due to monilia and trichophytosis than to any other cause, with aggravation of the local condition due to trauma and treatment. Excoriations often cause breaks in the skin which offer a portal of entry for all of the organisms normally found in this area such as streptococci, staphylococci, colon bacilli, fungi, monilia yeast cells and trichomonas (7). Contrary to common belief, gastro-intestinal parasites rarely cause pruritus ani (3). Pinworm infestation does cause temporary irritation about the anal opening especially in children, but the presence of this organism is easily detected by inspection and anoscopic examination and eradication of the oxyuriasis is accompanied by prompt relief from the local symptoms.

#### *Psychogenic Mechanism:*

Stokes maintains that there are always tension factors in the background of a chronic anal pruritic and the writer has noted many examples where the itching was a focal manifestation of a neurotically predisposed skin. "After fixation of the attention to the anal region, often by a local infective process, such as trichophytosis, the patient tends to set up a vicious circle of projection of his anxieties upon the perineum." (3)

Such a chain of events is difficult to interrupt unless the victim is thoroughly instructed as to how continued scratching may serve to set up irreversible skin changes.

#### *Mechanical Factors:*

Because of the anatomical arrangement of the anal area it is constantly exposed to trauma. Irritation is produced by the stool, especially if it is dry and hard or contains too much cellulose which may scrape the recto-anal mucosa. The ever-changing tension of the anal sphincters, rubbing of clothing, scratching, walking, enema tubes and, finally instrumentation, are all mechanical factors contributing to the development of pruritus ani. Many cases begin with an insignificant scratch or fissure.

Stillians (8) believes the use of dry toilet paper leaves a thin film of fecal matter on the anus and that this may be an important cause of itching in this region. Toxic material such as indole and skatole coming out of the rectum in the form of liquid or gas may be very irritating (9) and the perianal rawness and erythema noted after several loose stools lends support to the theory that some digestive juices may reach the

perineum without becoming altered chemically.

#### *Allergic Mechanism:*

Sensitization to specific foods, chemicals or drugs may be present at the beginning or develop during the course of the disease and in protracted cases this possibility should be explored. Phenolphthalein and a gum commonly use in laxatives and ice cream are common offenders among the ingested materials while resorcin, mercury, salicylic acid, and cocaine are often highly irritating when applied locally. In the author's experience sensitization to these chemicals is often expressly intensified by a preceding or concomitant fungus infection. The possibility of bacterial allergy must also be considered, but evidence for this has not been proved to the satisfaction of everyone.

#### *Symptomatology:*

As the name implies the most outstanding symptom of pruritus ani is intense itching and burning, which is characterized by remissions and exacerbations. Flare-ups often occur at night when the body is warm, thus interfering with rest and sleep. The condition may be acute or chronic. In the former there is redness, edema, excoriation, vesiculation, and sometimes weeping from denuded areas. In cases of longer standing there are usually lichenification, induration, and pigmentation, as these changes are indicative of chronicity. In the recalcitrant state the skin may be whitish in appearance, smooth and glistening, leathery, dotted with pigmented spots, or lie in deep folds radiating from the anal orifice.

#### *Treatment:*

There is no specific treatment for this symptom complex. All factors must be taken into account and therapy individualized for each patient. Careful history taking and persistence in a logical regimen will lead to relief if not cure in most instances. Measures for control of pruritus ani may be divided into three categories—systemic, local, and miscellaneous.

#### *Systemic:*

In chronic cases it is frequently noted that marked intensification of the disorder may accompany a period of nervous stress and when the tension is relaxed there is amelioration of the local pruritus. While this observation is no argument for formal psychotherapy in the average obstinate case it does suggest that an accurate appraisal of a patient's reaction to environment may be in order. Psychoneurosis is so manifest in some that suicidal tendencies may develop, in which case hospitalization is mandatory. (7)

Weight reduction can be helpful in the management of anal pruritics who are too fat. The author and others feel that obesity is a cause which is often overlooked.

The vulnerability of diabetics to monilia and fungus infections has already been discussed. It has also been mentioned that the pruritus ani and vulvae of diabetics has, in the writer's experience, frequently been cured by the control of the diabetes alone. Sutton (6) and Hesseltine (10) believe that diabetics are highly susceptible to mycotic organisms because dextrose favors their growth. Whatever the reason, maintenance of a

proper blood sugar level is a sine qua non in diabetics who have pruritus ani, and the local application of fungicides is of distinctly less importance.

Turell has observed a patient with localized pruritus ano in pellagra and effected a cure with the use of nicotinic acid. There is reason to believe that nicotinic acid and other members of the B-complex have much to do with skin metabolism and the physiology of the sebaceous glands. If nutrition is faulty, then B-complex may be an adjunct to treatment.

There is a menopausal type of pruritus vulvae and ani which usually responds readily to estrogenic hormones. One-half to one milligram of stilbestrol daily by mouth is adequate and it may also be given in suppositories. If there are objections to this form of treatment, 10,000 International units of estrone may be given intramuscularly at weekly or bi-weekly intervals.

Stokes (3) recommends a reduction in the carbohydrate content of the diet, and elimination of excess roughage. These measures are beneficial in most cases and the use of bran, nuts, whole wheat, raw fruits and vegetables is interdicted by the author. Stokes reduces or eliminates the consumption of alcoholic beverages and gives dilute hydrochloric acid by mouth. He states that allergic individuals with irritable bowel syndrome are benefited by calcium administration in addition to hydrochloric acid. Stools are examined for parasites (though, as previously noted, this is rarely important) and cultured. Occasionally it may be wise to change the intestinal flora. When specific food allergens are suspected, the elimination diets of Rowe may be employed because, as in other skin manifestations of allergy, intradermal or scratch tests seldom give accurate information. Milk, wheat, eggs and chocolate are common offenders. (11)

#### *Local:*

There is general agreement on the premise that local treatment suffers much more from the "sins of commission" rather than "omission." Most cases observed by internist and dermatologist alike have been grossly overtreated. (1-3-6)

Simple measures to insure scrupulous cleanliness are utmost in importance. Brunsting (1) stated that if local hygienic conditions were ideal, the functional element in pruritus ani would assume a place of major importance in the disease. Stokes (3) advises his patients to mop gently after each stool with a pledget of cotton soaked in 1:4,000 potassium permanganate. The use of dry toilet paper should be avoided. Many authorities do not like to use keratolytic and antipruritic drugs because patients are often sensitized to them. The author is particularly wary of salicylic acid, resorcin, sulfur, and ammoniated mercury. One per cent phenol in boric acid may be useful as a local application.

Mild astringents, keratolytics, antipruritics, and antiseptics have been recommended by Speare and Mabrey (9) who also emphasize the necessity of keeping the anal region clean by washing with soap and water after each bowel movement. The soap should be rinsed completely away with clear water. Many patients are relieved by these simple methods.

When the pruritus is acute, hot or cold boric acid compresses, sometimes alternating, give considerable relief. Sutton (6) recommends the removal of all grease and oil, and daily applies a 2 per cent aqueous solution of gentian violet. Sitz baths of 1:3,000 potassium permanganate may be beneficial at times. Castellani's carbolfuchsin paint has been found very useful by Stokes (3) who employs it diluted with water 1:3.

X-ray therapy enjoys a reputation for effectiveness which is hardly justified. In practice one notices that the better the constitutional factors are managed, the less frequently X-ray is needed. Roentgen therapy may relieve itching in many cases, although there are plenty of exceptions to this, but it does not cure the cause of the disease. Speare and Mabrey (9) were not impressed with the benefits of X-ray. Tomlinson (7) gives weekly X-ray treatments (75 r each) for eight doses, while Stokes (3) uses 400 r in six doses and if there is no improvement abandons this form of treatment.

In some series (8) local diseases such as fissures, hemorrhoids, cryptitis, proctitis, papillitis, etc., were present in forty per cent of the patients. Occasionally eradication of such lesions is followed by relief of pruritus but such instances are unusual. Recurrence following a brief remission is the rule. Some patients respond better if attention is given to complicating skin lesions such as fungus infections of the feet and seborrheic dermatitis. (7)

#### *Miscellaneous:*

A number of more or less radical procedures may be undertaken in case all other methods have failed. Ball (12) described a method for severing the superficial nerve filaments in the perianal region. Patients obtain relief following this procedure, but itching usually recurs in 3 to 6 months. Steinberg (13) has obtained satisfactory results with the perianal injection of Gabriel's solution (oil of sweet almonds, containing 0.5 per cent nupercaine, 1.0 per cent phenol and 10 per cent benzyl alcohol). Speare and Mabrey found that the solution used by Steinberg caused fibrosis and obtained relief in 70 per cent of patients by the subcutaneous injection of 3 to 5 cc. of alcohol. One quadrant at a time of the anal area is anesthetized by procaine, and then injected with the alcohol. Swinton (14) has had favorable responses with a similar method, but others (11) feel that the tendency to abscess formation and sloughing make the procedure undesirable.

Reich et al (15) obtained gratifying results in fifteen cases of intractable pruritus vulvae by injecting a warm solution (olive, almond and peanut oil containing 2 per cent procaine and 5 per cent benzyl alcohol) into the fatty tissue of the labia. A technique for surgical excision of the affected skin has been described by Scott and Young (16) but they emphasized that it should be employed only where all other methods have failed. Turell (17-18) had favorable experience in tattooing affected parts with mercury sulfide and Cantor (11) lauds tattooing with mercuric sulfide plus the operation of tattoo neurotomy as the procedure of choice. Stone in 1916 and later Wilson (19) described a technique of stippling the entire perineum with 95 per cent alco-

hol. A 26-gauge needle inserted perpendicularly is used and the procedure is carried out under general anesthesia. Two to four minims of absolute alcohol are injected under the skin at each point and the injections are about one-fourth inch apart. Care must be taken that the needle is through the derma and yet not too deeply into the subcutaneous fascia or abscess formation will result.

The author has employed this technique in many of the most obstinate cases with satisfactory results in most. It can be carried out in the office using intravenous anesthetics (evipal or pentothal sodium) but hospitalization for a day or two is the better way. Detailed case reports will not be given, but the experiences of one of my patients are worth mentioning. He had suffered with pruritus ani for fifteen years and when I first saw him he had just completed his third course of X-ray therapy. These had been fairly expensive and in his own words, "only made me worse."

The skin was the leathery texture characteristic of the intractable anal pruritic. The stippling technique resulted in complete relief for ten months, but at that time there was a slight recurrence. A repetition of the procedure resulted in apparent cure as the patient had no symptoms at the end of four years.

#### Conclusions:

1. Pruritus Ani is a symptom complex—not a disease.
2. A helpful outline of the varied etiological factors has been presented.
3. There is no cure, but when all phases of the disorder are taken into account most patients can be relieved.
4. Diabetes is a frequent cause and may be relieved by controlling the hyperglycemia.
5. Stippling the perineum with absolute alcohol may relieve many intractable cases.

#### REFERENCES

1. Brunsting, L. A.: The Treatment of Common Diseases of the Skin, *J. Lancet*, 60:438, 1940.
2. Sulzberger, M. B., and Wolf, J.: Pruritus and Its Treatment, *M. Clin. North America*, 19:971, 1935.
3. Stokes, J. H.: Pruritus Ani—Clinical Analysis, *New Internat. Clin.*, 1:147, 1940.
4. Terrell, Emmett H., and Terrell, Robert V.: Pruritus Ani, *South. M. J.*, 31:907, 1938.
5. Winkler, M.: Etiology and Pathogenesis of Pruritus. *Jadassohn's Handbuch der Haut-und Geschlechtsrourkeiten*, Berlin. Julius Springer, Vol. 6, Sec. 1, page 343, 1927.
6. Sutton, R. L.: Gentian Violet as a Therapeutic Agent, *J.A.M.A.*, 110:1733, 1938.
7. Tomlinson, C. C.: The Etiology and Treatment of Some Types of Pruritus. *Jour. of Omaha-Midwest. Clin. Soc.*, 4:82, 1943.
8. Stillians, A. W.: Therapy of Pruritus, *J.A.M.A.*, 114:1627, 1940.
9. Speare, G. S., and Mabrey, R. E.: *New England J. Med.*, 223:274, 1940.
10. Hesseltine, H. C.: Diabetic or Mycotic Vulvo-vaginitis, *J.A.M.A.*, 100:177, 1933.
11. Cantor, Alfred J.: Pruritus Ani, *American Journal Digest. Dis.*, 10:254-261.
12. Ball, C. B.: The Rectum: Its Diseases and Developmental Defects. London: H. Frowde and Hodder and Stoughton, page 332, 1908.
13. Steinberg, N.: Recent Advances in the Treatment of Rectal Diseases by Injection Methods in Ambulatory Patients, II—Pruritus Ani, *New England J. Med.*, 215:1019, 1936.
14. Swinton, Neil W.: The Injection of Alcohol in the Treatment of Pruritus Ani, *S. Clin. North America*, 19:689, 1939.
15. Reich, Walter J.: Button, Helen; Nechtow, Mitchell J.: A New Treatment for Intractable Pruritus-Vulvae. *American Journal Obs. and Gyn.*, 45:1036-1038, 1943.
16. Young, Forrest; Scott, W. J. M.: Radical Operation for Intractable Pruritus Ani. *Surgery*, 13:911-915, 1943.
17. Turell, Robert: Tattooing (Puncturation) with Mercury Sulfide and Other Chemicals for the Treatment of Pruritus Ani and Perineal, *J. Investigative Dermatology*, 3:289, 1940.
18. Turell, Robert; Buda, A. M., and Marino, A. W. M., *Arch. Dermat. and Syph.*, 41:521, 1940.
19. Wilson, W. M.: Treatment of Pruritus Vulvae by Alcohol Injection, *J.A.M.A.*, 110:493, 1938.

## Effect of Epidemic Gastro-Enteritis on Enterozoic Parasites

By

ROYAL L. BROWN,\* B.A., M.A., M.D., Ph.D. (pending)  
ONTARIO, CALIFORNIA

**E**LDERLY, institutionalized persons affected with an acute fulminating para-dysentery were studied at the Philadelphia General Hospital for enterozoic parasites; first for possible etiology, and later, following discovery of bacterial cause, to determine the effect of epidemic dysentery on such parasites.

Several instances have been recorded of amoebic and bacillary dysentery co-existing; and in areas of high incidence of amoebiasis as well as bacillary dysentery,

this dual etiology has been not infrequent. Furthermore, the high incidence of lumen dwelling parasites has made their presence in such dysentery cases comparatively frequent. The effect on the concerned parasites however, has not been well established.

#### MATERIALS AND TECHNIQUE

This investigation extended over 6 months during which 2-10 (average 4.0) stools were studied macro and microscopically on each of the 100 afflicted persons. Routinely a Ringer's saline film, a Lugol's iodine film, an iron-alum-hematoxylin stained slide, and concentrated films by both the de Rivas centrifugation and

Headquarters, 2nd Army Air Forces Flying Training Detachment.  
\*Then, Capt. M. C., 3045th A.A.F. Base Unit.  
Submitted July 20, 1944.

†This survey was made possible by the assistance of Dr. J. H. Clark of the Pathology Department of the Philadelphia General Hospital, and Dr. D. H. Wenrich of the Zoology Laboratory of the University of Penn.