Current Comments

To Put It Baldly: Treatment of Hair Loss Is a Losing Proposition

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For centuries, people have searched for remedies for hair loss. The ancient Egyptians prescribed a concoction that consisted of the fats of the lion, hippopotamus, crocodile, and snake. Other folk remedies handed down through the centuries include elm bark; watercress; onions and honey; quinine; and crushed bees, wasps, and horse leeches with salt. In the 1930s, some barber shops in the US were equipped with vacuum machines that were applied to the scalp. Its users believed this would stimulate the scalp and promote hair growth.[1]

The search for solutions to baldness has not stopped. Each year Americans pay about $3 million to a mail-order baldness-remedy industry. For their money they get lotions, vitamins, oils, perfumes, and other products of no proven value. The US Food and Drug Administration is trying to take these products off the market.[2]

There is, of course, no sure cure for baldness. In fact, there are several different types of baldness. It can be caused by malnutrition, disease, and, perhaps, by emotional stress. In some cases, it can be reversed. However, all of us are genetically programmed to lose some scalp hair throughout life. Some of us lose more than others. Genetics is the reason behind the vast majority of cases of baldness,[3] and there is *no* known adequate way to stop or reverse genetic hair loss.

It is not even certain why people seem to want a cure for baldness. Common baldness is not in itself unhealthful. Some people may regard it as a sign of old age and lost strength. But noticeable hair loss can begin by age 20 or earlier.[4] Interestingly, in our search of the literature on baldness, we found no studies of the average person's attitudes toward balding. Some literature does cover the psychological problems that have been said to *cause* baldness.[5-11] There are also psychoanalytical studies that examine hair as a sexual symbol.[12,13] It seems odd that social scientists have not taken a closer look at how people, bald or not, feel about baldness.

Baldness seems to have some hidden or unconscious meaning for human beings. The biblical story of Samson and Delilah perhaps epitomizes the negative attitudes. On the other hand, there is a positive side to baldness. It is said to connote dignity and intelligence. There is even a compliment buried in the medical term for baldness. Alopecia comes from the Greek word for fox. Baldness is called alopecia because foxes are subject to bald patches. But the fox is also an animal renowned in folklore for its cunning.[1]

To understand why people lose their hair, it's helpful to understand how hair grows. Humans are relatively unhairy mammals, but like all mammals, they have two types of hair. Vellus hairs are so fine and fair that they are barely visible to the naked eye. They grow all over the skin, except on the soles and palms. The coarser, longer hairs you can see are called terminal hairs. After puberty, they too occur almost everywhere on the body. The reason scalp and men's facial hair grow to a greater length than

other body hair is not fully understood. We do know it is a product of our evolutionary heritage.[14]

Hairs are structures made up mostly of dead cells that contain large amounts of a fibrous protein called keratin. They grow from hair follicles, which are tubes that begin in the dermis and end in openings on the skin surface. A small mass of cells at the bottom of the follicle produces the hair. Follicles periodically stop growing hair, become dormant, and then start growing hair again. The newly grown hair pushes the old one out.[15] Each follicle has its own cycle. For scalp hairs, the growth stage lasts from three to five years; the dormant stage, about three months.[16]

Normal scalp-hair loss can be accelerated to produce baldness. There are several ways that this can happen. Some people literally pull out patches of their hair. When it's done inadvertently, it's usually the result of braiding one's hair too tightly too often, or putting hair under too much tension with curlers. It can also be caused by excessive brushing, or brushing or combing wet, tangled hair. The hair loss this causes is the result of damage to the hair follicle. Repeated damage to follicles may eventually destroy them so that hair won't grow. Baldness that occurs in this way is called traction alopecia.[17]

Essentially the same type of damage occurs in a disorder called trichotillomania, which is the irrational behavior of pulling out one's hair. It's been reported to occur among children or adults experiencing stressful events, such as a parent's death or a financial disaster. In time it may disappear; sometimes psychiatric counseling helps.[8,9] But as with traction alopecia, bald spots may persist throughout life.[17]

In some types of reversible or treatable baldness, scalp hair falls out suddenly. This kind of baldness is sometimes called telogen effluvium.[18] There are many causes. Toxins and fever from bacterial infections can cause hair loss.[19] (I vividly remember the time my uncle lost a beautiful crop of red hair after a bout with scarlet fever.) Sudden baldness may also be related to diet. A shortage of the vitamin biotin,[20] or too much or too little vitamin A,[21] may make one's hair fall out. Also, people who suddenly and severely limit their caloric intake have suffered hair loss.[22] Emotional stress or mental disorders have been reported as possible causes.[23] Many such cases of alopecia can be reversed when the cause is corrected.

One type of sudden hair loss, alopecia areata, is an autoimmune disease, in which the body's immune system attacks parts of the body itself; in this case, hair follicles are attacked. Other autoimmune diseases include lupus erythematosus, which is characterized by arthritis-like symptoms and a reddening of the skin, and vitiligo, which is manifested by smooth white spots on the skin. Alopecia areata sometimes occurs with some other autoimmune diseases.[24]

Dermatologist Rudolf Happle, University of Münster, Federal Republic of Germany, has shown that in some cases alopecia areata can be treated with chemicals that cause an allergic reaction on the scalp. In a 1977 study, he showed that a chemical called dinitrochlorobenzene (DNCB) helped regrow hair on the scalps of 33 of 43 patients.[25] Since then, DNCB has been shown to be mutagenic. So Happle is studying another allergy-inducer, squaric acid dibutylester (SADBE). This chemical helped regrow hair on 37 of 53 alopecia areata sufferers.[26] Happle theorizes that induced allergy might generate certain lymphocytes that inhibit the reaction against hair follicles.[27] I should emphasize that this treatment is good only for alopecia areata, and doesn't always work.

Cancer patients who undergo chemotherapy may experience hair loss as one of many disturbing side effects. Though this side effect seems trivial in comparison to the disease, it can be emotionally distressing, since hair can be lost in a day or two. This hair loss could

be more serious than it seems, because a patient's attitude may be important in treating cancer. Fortunately, hair loss can be prevented in some cancer patients receiving the drug doxorubicin. The solution is to chill the scalp while the drug is being administered. Apparently the coldness causes vasoconstriction; thus, smaller amounts of the drug reach the scalp. The chill also reduces cellular absorption of the drug. A study by Judith C. Dean and colleagues, University of Arizona Cancer Center, showed that 20 of 33 patients receiving this treatment suffered less hair loss.[28]

The chill treatment is similar to an earlier one, called a scalp tourniquet. Patients' scalp circulation is decreased by an inflatable rubber ring while certain cancer drugs are administered. This, too, diminishes the blood flow to the scalp and may decrease hair loss.[29]

The most common form of baldness is androgenetic alopecia, which is also called male pattern baldness. It is a dominant hereditary trait in both sexes. It's also linked to hormones. Our hair follicles seem to be genetically predetermined to be sensitive to androgens, or male hormones. This inherited sensitivity to androgens causes hair loss.[30]

In 1942, Yale University anatomist James B. Hamilton reported evidence for the androgen link from a study of 104 men who had been castrated. Nearly all of these men had a full head of hair. Yet when they were injected with male hormones, those with a hereditary tendency toward baldness began to lose their hair.[31] Thus, those who associate hair loss with lack of masculinity obviously have it all wrong. The only sure way to prevent androgenetic alopecia in men is castration (or large doses of female hormones).

Women can suffer from androgenetic alopecia, too. In women, it is usually characterized by sparseness or diffuse thinning of the hair. Hair loss is not usually as severe as it is in men, but it is caused by the same hormonal mechanism.[32,33] Anti-androgen treatment may help slow the process.

Since androgenetic alopecia can't be cured, many people look for ways to cover it up. There are several ways to do this. All of them have advantages and disadvantages.

Hair transplants have been known to work relatively well for about 25 years, since the technique was pioneered by New York City dermatologist Norman Orentreich.[34] Orentreich's method is simply to remove several groups of ten to 15 follicles from the back of the head and transplant them to a bald area of the same scalp. The transplanted follicles grow hair as before in their new locations. This method is usually safe if done by a qualified physician. The areas from which follicles are removed won't grow hair again, but hair from the adjoining follicles camouflages the loss.

Transplants have their drawbacks, though. It's not always possible to cover an entire balding scalp by this method, simply because there may not be enough transplantable hair follicles on one's scalp to go around. But one need not have *all* of one's hair back to achieve a satisfactory look. Also, it takes several weeks to complete the procedure and nine months before the hair is completely regrown. A hair transplant operation can cost from $750 to $10,000.[35]

A variation on this procedure is to graft whole skin flaps of hair follicles from the back of the head to the bald spots. This method was developed by Argentine surgeon José Juri,[36] and its usefulness was confirmed by plastic surgeon Sheldon S. Kabaker, University of California, San Francisco.[37]

Hair transplants should not be confused with a dangerous treatment called synthetic hair implant. In this method, strands of nylon or other synthetic materials are surgically implanted in the patient's scalp. The medical literature on this treatment is uniformly negative. A recent study of 20 implant patients documented the ugly side effects of this

technique.[38] Usually the fibers were pulled out during brushing or shampooing. Some broke off, leaving the knot embedded in the scalp. These knotted fibers caused painful infections, swellings, inflammations, and scarring. All patients lost their implanted fibers in less than ten weeks. Nine of them lost some natural hair as a result of the infections. Other researchers have reported similar dismal results.[39-41] With good reason, the FDA is considering a ban on this operation.[3]

Hairpieces and wigs are a safe and simple means of disguising baldness and they are less expensive than transplants. Good ones made of human hair cost $500 and up. One advantage to hairpieces and wigs is that they require no surgery. But they can make the wearer hot and uncomfortable, especially since they are often held to the scalp with adhesive tape.[35] The body loses a lot of heat through the scalp.[42]

Hair weaving also involves using a hairpiece to cover the scalp. The difference is that the hairpiece is braided securely to the wearer's remaining natural hair. As with plain hairpieces, this cover-up method can be both unconvincing and uncomfortable. Also, the fit must be periodically readjusted because the growth of one's natural hair loosens the hairpiece from the scalp. A too-tight weave, of course, can cause traction alopecia.[35]

The simplest "cure" for baldness is simply to accept it. Some bald men have even gone beyond mellow, philosophical acceptance of baldness. A seven-year-old organization called the Bald Headed Men of America (BHMA), 901 Arendell Street, Morehead City, North Carolina 28557, claims a membership of 9,500 (three are women). The founder, a printer named John T. Capps III, urges members to take a militant sense of pride in baldness. The pride is laced with a liberal dose of humor, evidenced by the paraphernalia BHMA sells. It includes buttons and stickers with slogans like "Rub a bald head tonight," and "God only made a few perfect heads, and those he didn't like, he covered up." Also available, for $2.50, is a brush for bald heads (no bristles). Capps, who signs his letters "Bald John," is simply trying, through silliness, to make people aware that too much concern over one's hair, or lack of hair, is sillier still.[43]

Undoubtedly, however, many people still wish there was a chemical cure for male pattern baldness. Unfortunately, there is no such thing as yet. It's always possible, though, that basic research on the biology of hair growth may turn up a solution.

The specialty of hair growth is not a large or active enough field to have produced a research front that can be identified with ISI/BIOMED™. However, William Montagna, director, Oregon Regional Primate Research Center, tells us that scientists are interested in learning how hair grows.[44] In a telephone conversation, he mentioned some leading researchers in this field. They include Jean D. Wilson,[45] University of Texas, and colleagues, who are studying androgen metabolism and hair, and Vera H. Price,[33] University of California, San Francisco, who has examined steroid metabolism in hair follicles. Montagna's work includes studies of baldness in stump-tailed monkeys.[46] I should emphasize that such work is basic research on the biology of growth, *not* applied research aimed at finding a chemical treatment for androgenetic baldness.

However, a recently-begun study of a drug called minoxidil could conceivably lead to a baldness treatment. Minoxidil is a vasodilator used for treating cases of severe hypertension that have resisted other drugs. As a side effect, minoxidil induces hypertrichosis, or excessive hair growth, in many patients. One recent case was reported by Anthony R. Zappacosta, Bryn Mawr Hospital, Pennsylvania.[47] He said that a 38-year-old man, bald since 20, regrew his dark-brown scalp hair after treatment with minoxidil.

The drawback to minoxidil's hair-growing properties is that its effects are

unpredictable. In a case reported by J.L. Burton and A. Marshall, Royal Infirmary, Bristol, England, a bald man given minoxidil for hypertension had increased hair growth on his face, body, ears, and eyebrows—but not on his scalp.[48] Zappacosta's patient also experienced increased growth of the hair on his face and body. Side effects like this sometimes make severe hypertensives reluctant to take minoxidil.

The reason minoxidil grows hair is unknown. And another of its side effects is a possible decrease in blood pressure. But a major pharmaceutical company is studying it in search of a baldness treatment. In April 1981, *Fortune* magazine reported that Upjohn Co., Kalamazoo, Michigan, has funded several researchers to study minoxidil in male pattern baldness and alopecia areata. Upjohn markets the drug under the trade name Loniten. The researchers include Howard Baden, Harvard Medical School, and Orentreich.[49] *Fortune* reporter Lee Smith says the results will not be available until April 1982 or later. Upjohn does not want to raise false hopes, because there's little evidence at this point.

Of course, anyone who does develop a baldness treatment stands to reap huge profits. One hopes more basic research will lead to a better understanding of all causes of hair loss. Understandably, alopecia does not get the highest priority at the National Institutes of Health. However, a better understanding of how the body grows hair is a valid goal. It is possible that, given the genetic basis for much scalp baldness and body-hair growth, genetic engineering may one day provide a solution to androgenetic alopecia. Male pattern baldness, like the common cold, is a relatively trivial problem that won't go away. But the hope always remains that science may one day uncover a solution.

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