

Preliminary and Short Report

**REMOVAL OF INTACT HAIR PAPILLA AND CONNECTIVE
 TISSUE SHEATH BY PLUCKING ANAGEN HAIRS***

ERICH LUDWIG, M.D.

Plucking of anagen hairs, using the technique of van Scott *et al.* (1), results in a transverse fracture of the hair bulb at a level close to the summit of the hair papilla. Van

hair papilla and a complete connective tissue sheath including the base of the papilla (Pinkus' "papillenpolster") have not yet been described. It therefore appeared worthwhile to report briefly on such an unusual finding.

TABLE I

Frequency of trichograms showing anagen hairs with papilla in normal controls and in patients with various scalp disorders

Clinical diagnosis	No. of trichograms performed	No. of trichograms showing anagen hairs with intact papilla	% of trichograms showing anagen hairs with intact papilla
Common baldness (Androgenetic alopecia)	47	12	26
Normal controls	10	4	40
Seborrhea oleosa	51	10	20
Telogen effluvium	12	4	33
Alopecia areata	3	1	
Seborrheic dermatitis	2	1	
Alopecia cicatricata	2		
Psoriasis	1		
Tinea amiantacea	2		
Pityriasis capitis simplex	2		
	132	32	24

When plucking tufts of hair in patients with common female baldness (female pattern alopecia, androgenetic alopecia), in two cases anagen hairs were found showing roots surrounded by all the elements of the lower portion of the hair follicle, only seen on longitudinal section through a hair follicle (Fig. 1). In one patient, of 206 plucked hairs there were 2 anagen hairs with papillae; in the other patient 9 out of 116 hairs plucked were anagen hairs with papillae. Plucking on the vertex was done in the usual way—by a quick jerk in order to minimize pain and to avoid artificial deformation of the hair roots.

In order to determine whether the occurrence of plucked hairs with intact papillae and preserved connective tissue sheathes is the result of a very quick and forceful plucking or is a characteristic feature in common baldness, trichograms were also made in normal subjects, in additional cases of common male and female baldness, as well as in patients with various other scalp disorders. As can be seen from Table 1 such hairs occur with approximately the same frequency in normal subjects as in both male and female patients with pattern alopecia. Table 2 shows that there is no obvious relationship between the appearance of anagen hairs with papilla and a special distribution pattern of plucked hairs.

It is thus reasonable to assume that the appearance of anagen hairs with papillae depends entirely on the way in which the hairs are removed.

Scott was the first to mention that, occasionally, portions of the connective tissue hair papilla remain attached to the bulb. (2) This infrequent finding is illustrated in a photograph appearing on page 442 of the "Biology of Hair Growth" of Montagna and Ellis. It seems that plucked hairs showing an intact

* From the Department of Dermatology of the University of Hamburg, Germany.
 Received for publication August 8, 1966.

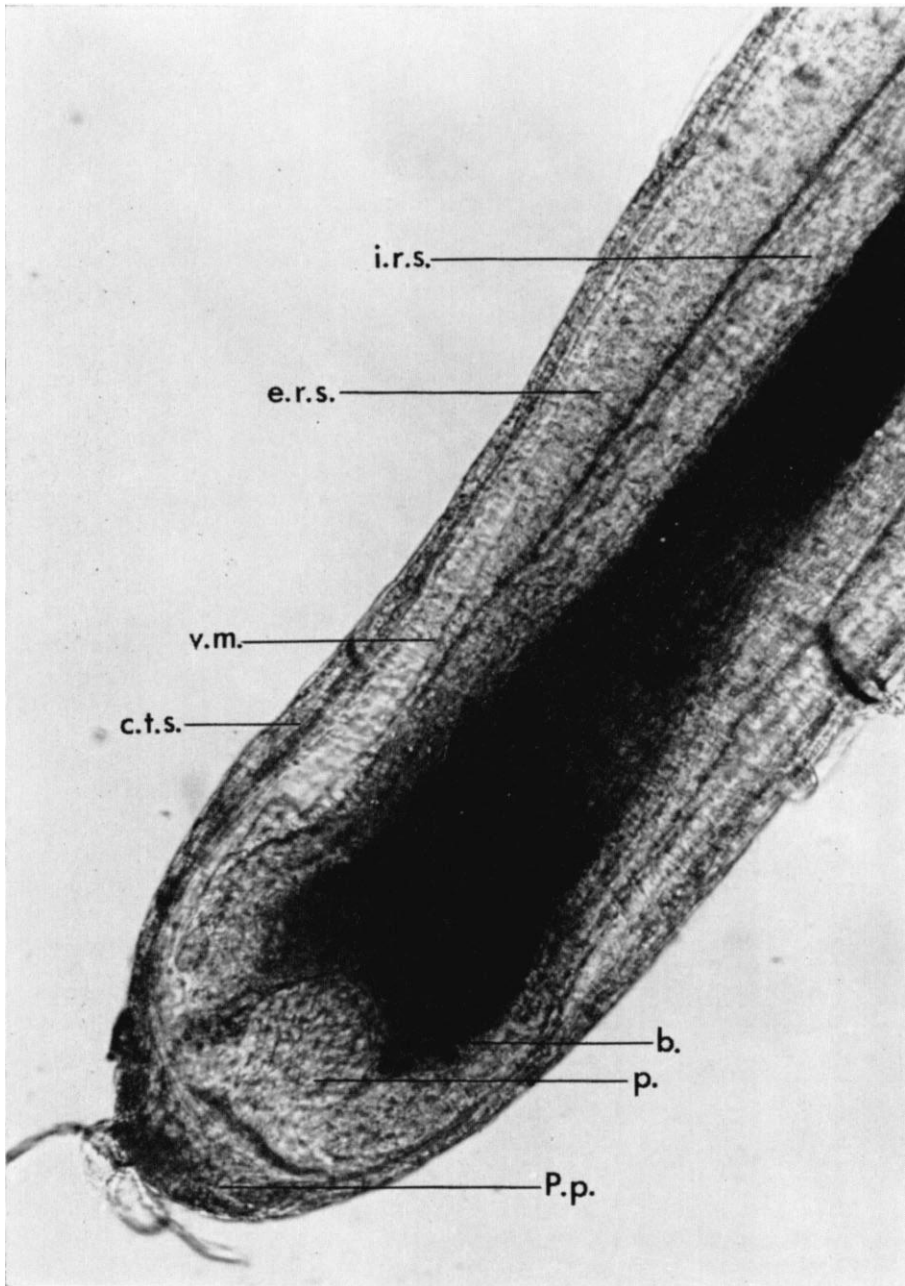


FIG. 1. Plucked anagen hair with its onion-shaped bulb, intact dermal papilla and all the elements of the lower portion of the hair follicle. i.r.s. = internal root sheath, e.r.s. = external root sheath, v.m. = vitreous membrane, c.t.s. = connective tissue sheath, b. = hair bulb, p. = dermal papilla, P.p. = "Papillenpolster". $\times 125$

TABLE II

Distribution pattern of hairs in samples in which anagen hairs with intact papilla were found

Patients			Hairs epilated									
Name	Clinical diagnosis	Sex and Age	Total No.	anagen			catagen		telogen		dystrophic	
				with papilla	No.	%	No.	%	No.	%	No.	%
H.L.	Androgenetic alopecia (common baldness)	20 ♀	82	10	57	69	—	—	22	27	3	4
U.M.	“ “	23 ♀	118	1	83	70	2	2	29	25	4	3
E.W.	“ “	41 ♀	133	4	63	47	—	—	70	53	—	—
S.G.	“ “	31 ♀	89	2	55	62	1	1	33	37	—	—
E.P.	“ “	23 ♀	87	1	45	52	3	3,5	36	41	3	3,5
G.E.	“ “	31 ♀	129	9	67	52	4	3	56	44	2	1
E.S.	“ “	37 ♀	92	2	61	66	—	—	31	34	—	—
E.P.	“ “	37 ♀	198	3	143	72	1	0,5	53	27	1	0,5
M.M.	“ “	18 ♂	124	1	51	41	1	1	68	55	4	3
R.W.	“ “	28 ♀	110	1	81	73	2	2	25	23	2	2
R.W.	“ “	23 ♂	122	1	82	67	2	2	38	31	—	—
H.S.	“ “	45 ♀	135	3	93	69	1	1	38	28	3	2
G.W.	Normal control	65 ♀	118	1	105	89	—	—	13	11	—	—
B.S.	“ “	22 ♀	88	1	82	93	—	—	6	7	—	—
H.F.	“ “	20 ♀	91	1	70	77	1	1	20	22	—	—
M.B.	“ “	52 ♀	95	1	79	83	—	—	15	16	1	1
R.Z.	Seborrhea oleosa	44 ♀	191	1	161	84	2	1,5	27	14	1	0,5
G.T.	“ “	35 ♀	91	1	72	79	—	—	19	21	—	—
B.K.	“ “	25 ♀	89	4	77	87	—	—	10	11	2	2
U.H.	“ “	31 ♀	108	1	97	90	2	2	9	8	—	—
C.R.	“ “	28 ♀	94	1	66	71	4	4	20	21	4	4
R.B.	“ “	25 ♀	115	5	85	74	1	1	28	24	1	1
E.B.	“ “	33 ♀	100	1	72	72	1	1	27	27	—	—
G.A.	“ “	30 ♀	150	1	124	83	—	—	26	17	—	—
M.M.	“ “	54 ♀	136	1	109	80	1	1	25	18	1	3
U.N.	“ “	38 ♀	106	8	85	80	—	—	21	20	—	—
I.S.	Telogen effluvium	70 ♀	115	3	71	62	2	1	39	34	3	3
H.S.	“ “	67 ♀	134	1	74	56	—	—	58	43	2	1
H.S.	“ “	50 ♀	113	1	77	68	2	1	31	28	3	3
J.P.	“ “	26 ♀	166	8	130	78	—	—	36	22	—	—
J.K.	Alopecia areata	59 ♀	99	7	84	85	1	1	4	4	10	10
I.P.	Seborrheic dermatitis	26 ♀	115	2	88	77	—	—	27	23	—	—

REFERENCES

1. Van Scott, E. J., Reinertson, R. P. and Steinmüller, R.: The growing hair roots of the human scalp and morphologic changes therein following amethopterin therapy. *J. Invest. Derm.*, 29: 197, 1957.
2. Van Scott, E. J.: Response of hair roots to chemical and physical influence. In "The Biology of Hair Growth" ed. by Montagna, W. and Ellis, R. A. New York, Academic Press, 1958.