

# Dermatological Examination of the Qilakitsoq Eskimo Mummies

N. P. KROMANN, F. MIKKELSEN, E. R. LØYTVED & J. P. HART HANSEN

Kromann, N. P., Mikkelsen, F., Løytved, E. R. & Hart Hansen, J. P. 1989. Dermatological Examination of the Qilakitsoq Eskimo Mummies. – *Meddr Grønland, Man & Soc.* 12: 83–88. Copenhagen 1990–01–26.

The skin was mainly well preserved with intact surface relief and normal histological appearance. Two small keratotic papillomas on a finger of a young woman were histologically compatible with common warts. In a fifty-year-old woman the hair of the crown was extremely sparse and the breasts were atrophic. A virilizing tumour of the ovary may have been the cause. The fingernails of two women showed marks from work, and in two persons the toenails were thickened, presumably because of insufficient shortening.

*N. P. Kromann, Department of Dermatology, Gentofte Hospital, DK-2900 Hellerup, Denmark. F. Mikkelsen, Nygade 9, DK-4700 Næstved, Denmark. E. R. Løytved, Department of Dermatology, Finsen Institute, DK-2100 Copenhagen Ø, Denmark. J. P. Hart Hansen, Department of Pathology, Gentofte Hospital, DK-2900 Hellerup, Denmark.*

## Skin

The four most poorly preserved mummies (2,5,7,8) were all in such a state that their clothing was removed and conserved separately to permit more careful study of the bodies. The skin of these mummies, as well as that of the better preserved ones, was marked by mummification. It was dry and shrunken, dark brown, and hard as wood. To a varying extent there was a white, often crackled layer of mould up to a thickness of a few millimetres. The skin of the abdomen was very dark, as was the front of the thighs in some cases. This was probably due to decay processes in the abdominal cavity after death.

The desiccating effects of the mummification process had stretched the skin enlarging the eye opening, nostrils, and mouth, and sometimes causing cracks. Sockets and mouths were asymmetrical in places.

In the palms of the hands accessible to examination there were no traces of wear or pressure in the form of calloused skin. The natural lines of the skin were preserved to some extent, and in a few cases prints could be made of the fingers, palms, and foot soles. The skin was often loosened or destroyed. All prints showed patterns and lines very similar to modern ones.

In several places there were post-mortem maggot holes in the skin. Some of these holes were extremely enlarged as a result of the mummification of the skin. There was a scattering of empty reddish brown cocoons on the mummies and their clothing. There were also

some desiccated mosquitoes and flies, in fact mummified like the humans and therefore well preserved. Some of the insects were found inside the body cavities themselves.

The insects and the cocoons come from four different two-winged families (*Diptera*), namely winter gnats, *Borboridae*, swamp flies and blowflies. The blowfly cocoons come from the deterioration of the corpses during the first summer, for this fly is in fact the means by which carrion is broken down in nature. *Borboridae* cocoons may also possibly stem from the first year after

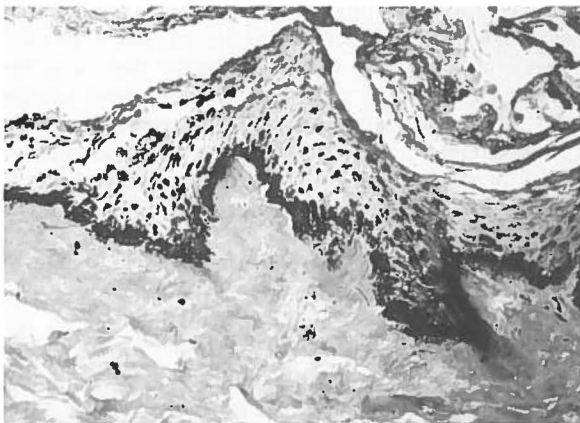


Figure 1. Histological section of mummified skin after rehydration. The horny layer is partly separated during the preparation. The nuclei of epidermis is preserved.

death, for the larvae of these flies live where there is rotten material. In contrast, the winter gnats and swamp flies are not proper carrion fauna. These insects may therefore have arrived at any time after death.

## Hair

All the mummies had perfectly preserved, normal eyebrows. However, the eyelashes were missing in some cases because of their precarious position in the thin eyelids.

It was possible to examine the hair on the heads of all the mummies, apart from mummies 1 and 6, whose hair was almost hidden by the parka hoods. None of the mummies showed traces of a coiffure and a topknot could not be identified. Headbands were not found. The children's hair was very thin and wispy. In several places the hair was loose. A common reason for the loss of hair in ancient Greenland was the topknot, once so popular among the women. Constant pulling on the hair destroys the hair follicles at the temples, resulting in baldness here.

Some had lost their hair while alive, whereas the hair of others had become detached after death. One possible cause of hair loss during life is favus, a fungal disease which affects the scalp in particular and which causes cicatricial baldness. This affliction was once widespread in Northwest Greenland, and as late as 1958 there were a number of new cases, especially among families living in turf houses (Lomholt 1959), like those probably inhabited by the Qilakitsoq people.

Hatched nits were found in the hair straws of the adults, but no lice could be localized in the scalps.

## Nails

In some cases the fingernails seemed very long. The shrinkage of the skin had caused the nail wall to recede. Accessible nails were scrutinized in the dissecting microscope for signs of change ascribable to work (mummies 5,7,8). Numerous transverse cuts were revealed by this technique on the left thumbnails of two mummies. These marks were probably made when the nail was used as an underlay for cutting thread with an *ulo* (a woman's knife) or cutting holes in the edge of the hides before stretching them. Both are practiced by some few women in East Greenland to day.

Other traces of activity were small chips in the exposed edge of some fingernails, an unevenly worn exposed edge on the nails of the index and middle fingers towards the thumbs, and the wearing down of the superficial, relatively soft layer of the nailplate, exposing the thick, hard layer of the nail with its longitudinal striated structure. This latter change may stem from both me-

chanical and chemical influence. Warm water and alkaline solutions may have caused scaling of the soft nailplate (Baran 1983). The washing of hides with old urine might explain the result, as old urine is alkaline.

Slightly pronounced transverse grooves in the nailplate were observed in two of the women. These furrows, which are probably caused by inflammation of the nail wall, are frequently seen today among housewives and others who work with their hands submerged in water (Baran 1983).

The toenails could be inspected in four of the mummies (2,5,7,8). They were thickened in two cases – this was probably due to lack of care and insufficient cutting. The thickening of toenails even in young people is a common finding in Greenland today. The thick nails (*onychocauxis*) may also be the result of small footwear. In the same two persons the nails of the big toe were worn into shape by the sole and side wall of the *kamiks*.

## Dermatological findings in the individual bodies

*No. 1 (Infant, approximately six months old, dressed):* Only face and hands were free from the dress. Apart from the eyelids no shrinkage or skin defects were seen. The lips were well preserved. The skin was without any signs of disease. The hair was thin and wispy – as the rule in babies.

*No. 2 (Boy, 4–5 years old, undressed):* The skin was not cleaned for the cracked layer of white material, which partly consisted of mould. The eye openings and nostrils were unevenly widened. The mouth opening had a large tear in the right side. The external genitals were preserved. As in mummy 1, the hair was thin and sparse. This is fairly common at this age in children with Down's syndrome (Rook & Ebling 1979). Only the toenails could be examined. They were approximately one centimetre long and their free edges were worn into shape by the *kamik* sole. The nailplates had a normal smooth surface but they were rather thick, presumably because of lack of shortening (Fig. 2).

*No. 3 (Woman, 20–25 years old, dressed):* Only head, hands and thighs could be examined because of the presence of the garments. The skin was cleaned. Face and hands showed no skin abnormalities. The fingernails did not disclose gross abnormalities but they could not be studied in detail with the dissecting microscope. Between the lower edge of the short sealskin trousers and the boots, thirty centimetres of the thighs were naked. Here the skin was folded longitudinally because of the dehydration of the underlying soft tissues, but was otherwise normal. All of the long and strong hair of the crown was loosened and pushed backwards to the neck. The hair follicles were open, thus demonstrating that putrefaction was the cause (Fig. 3).



Figure 2. Top: Right forefoot of the 4-5-year-old boy. The skin and nails were not cleaned. Bottom: Right forefoot of the 18-20-year-old woman. In both persons one notices the thickened nails, and in the boy all the nails are worn to the shape of the *kamik*. The nails of the big toes have the characteristic shape of the free edge, like a wide angle.

*No. 4 (Woman, approximately thirty years old, dressed):* As this body also had to be conserved with the garments *in situ* only the skin of the face and hands could be examined. The skin of the entire face was extremely well preserved, but very wrinkled. This wrinkling was especially obvious on the cheeks. As the woman was rather young, the folding of the skin is presumed to have developed *post mortem*. This was the only mummy whose eye sockets and mouth were not enlarged by the tautening of the skin. The lips of this woman were thus well preserved. Perhaps, like the infant, she had a thicker layer of fat in the subcutaneous layer of the face, as often seen among Eskimos. This layer of fat, combined with the cheekbones, makes the face seem broad. The hair was missing in the left side of the crown and in the temples. Open hair follicles showed the baldness to be a *post mortem* phenomenon.

*No. 5. (Woman, approximately forty years old, undressed):* Only the face was cleaned. This body was extremely lean and gave an impression of emaciation. Otherwise the skin showed no signs of disease. The



Figure 3. The head of Mummy No. 3. The hair is displaced and open hair follicles are seen all over the crown. The eyebrows are well preserved. In the left orbit and the right temple maggot holes can be seen.



Figure 4. The almost bald crown of mummy No. 5. The hair loss is symmetrical and decreases gradually against front, neck and temples. These cannot be post-mortem alterations but must be a so-called male-pattern (androgenic) baldness and might well be due to a virilizing tumour.

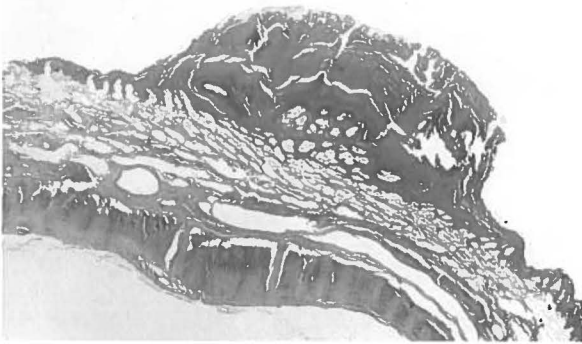


Figure 5. Histological section of a hyperkeratotic papilloma from the right fourth finger of mummy No. 7.

breasts were atrophic. The hair was very thin on the crown but thicker towards the temples and the nape of the neck (Fig. 4). The sparse hairs on the crown resembled the physiological type of baldness in men, although it is rare for women to be bald. Physiological



Figure 6. Hatched nits on the hair of mummy No. 7.

baldness is uncommon among pure Eskimos, even in men. The baldness might be due to a virilizing tumour, most likely of the ovary. Several fingernails and all the toenails were shed. The left thumbnail had a single transverse groove, but no cuts in the nailplate or other signs of work were seen. The toenails were normal without any characteristics.

*No. 6 (Woman, about fifty years old, dressed):* The face and hands were cleaned. The skin was damaged under the eye sockets and the skin of the chin was drawn downward exposing a part of the jawbone. The hair was covered by the hood of the jacket except for the forelock. The hands were clenched on the chest and thus the nails could not be inspected.

*No. 7 (Woman, 18–20 years old, undressed):* The face, hands and feet were cleaned. The body and the extremities were covered by a very thick layer of white material with feathers and grass embedded from the underwear and the boots. This young woman had one superficial lesion by the inner corner of the right eye and another one upwards in the abdominal wall. The right eyeball was particularly well preserved with no lesions and X-ray examination of the bone tissue beneath the lesion showed normal conditions without fractures. The lesion in the abdominal wall affected the skin only, as the bottom consisted of muscle tissue. There was nothing to indicate that these lesions occurred while the person was alive. Mummy 7 was the only one of the undressed women to have a relatively large abdomen; it hung down towards the thighs covering the external sexual organs. On the dorsal aspect of the proximal interphalangeal joint of the right fourth digit a three millimetre hemispherical tumour resembling a common wart was seen. On the dorsal side of the distal phalanx of the same finger a two millimetre blue tumour was located. Histologically, both tumours were hyperkeratotic papillomas compatible with common warts (*verruca vulgaris*) but the viral etiology could not be proven, not even by electron microscopy (Fig. 5). Under the left

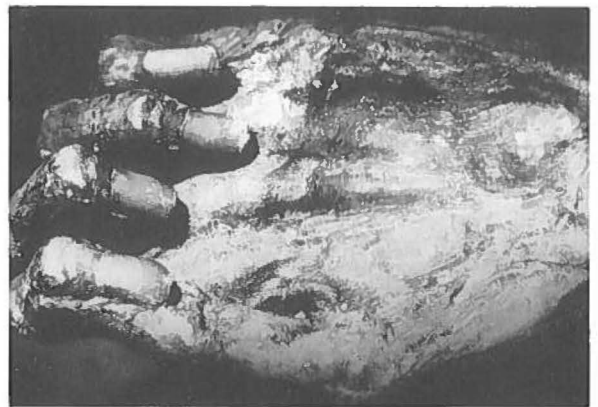
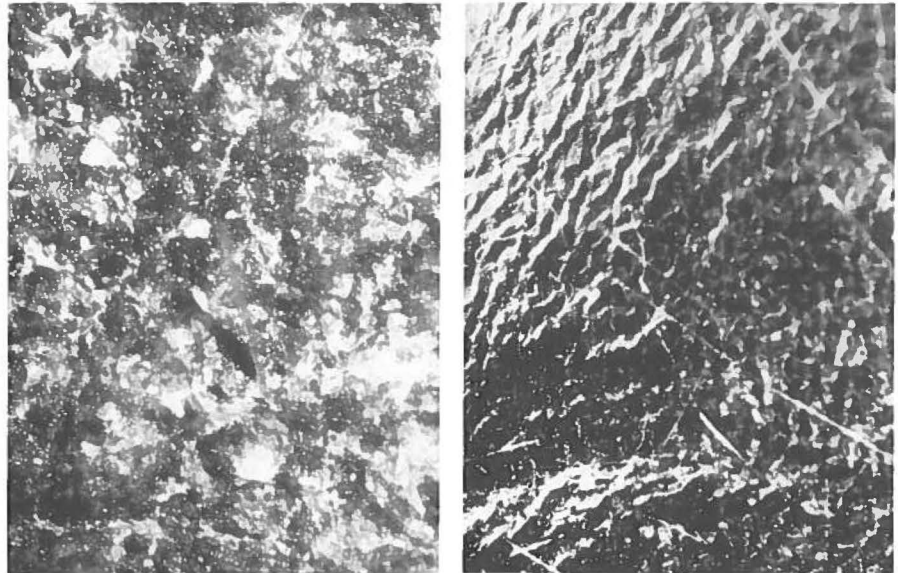


Figure 7. The left palm of the 18–20-year-old woman. The four ulnar nails are very long. This was the true length in the live person. The cuticle is not retracted (cf. Fig. 9).

Figure 8. Left: Thin atrophic skin from the dorsal wrist of a 50-year-old woman (Stereomicroscopy). Right: Skin from the same region in the 18–20-year-old woman. The normal relief of the skin is preserved.



foot the epidermis was shed except in the foremost part of the sole. Just behind the third toe an approximately one centimetre elevation which disrupted the otherwise well-preserved surface pattern of the sole was situated. Histology revealed only cornification (Fig. 2). The hair of the head was very strong and about fifty centimetres long. It had more nits on the hairs than any of the other mummies (Fig. 6). The four ulnar fingernails on both

hands were extremely long (Fig. 7) and as a whole the nails did not carry signs of hard work (cf. mummy No. 8). The fingernails showed in the dissecting microscope: 1) a few knife cuts in the nailplate of the left thumb; 2) scaling of the superficial soft layer of the nail plates (*onychoschizia*). The toenails were thick and clawlike on the four fibular toes on both feet. They were not very long. The distal part was polished where they had

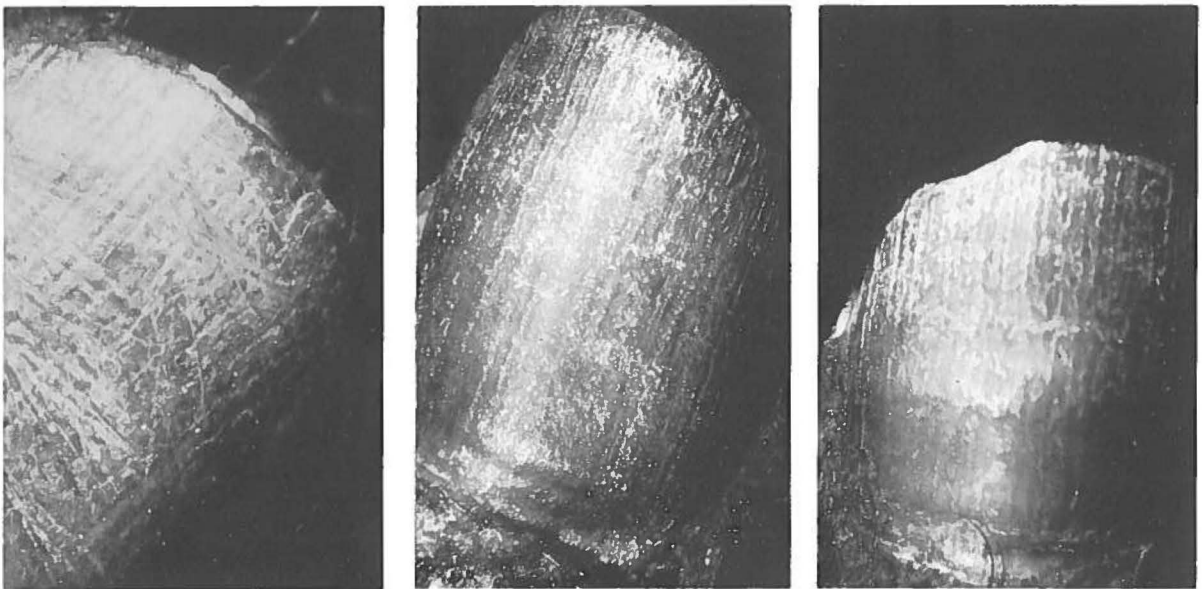


Figure 9. Stereomicroscopic appearance of nails from mummy No. 8. Left: The left thumbnail with countless transverse cuts from a knife. Middle: The nail of the left index finger. The free edge is worn mostly on the radial side. Right: Index nail of the right hand. The lesion in the free edge and the shallow transverse grooves may also be due to work. The cuticle has retracted a good millimetre during the drying process. In all of the three photos the longitudinal striation of the nailplate is obvious. The superficial soft and smooth layer have been abraded by mechanical and perhaps chemical action.

rubbed against the interior of the boots (Fig. 2). The nails of the big toes were not thickened. The free edges were worn into shape by the *kamik* bottom.

*No. 8 (Woman, approximately fifty years old, undressed):* The face, hands and feet were cleaned. The skin of the face had been drawn to the right of the front and to the left in the lower part before the process of drying had finished. This is obvious from the disfiguring of both the nostrils and the tattooing in the front (Fig. 6 in Kromann *et al.*, this volume). Something heavy must have been in direct contact with most of the face, where the colour is dark, because the drying process was delayed and decomposition thus went further. The skin of the dorsal wrist was studied in the dissecting microscope. The wrists are normally exposed to sun, cold and wind because the sleeves are short in women's dresses. As a result the skin was very thin and atrophic, and lacked the original surface relief. In Fig. 8 the skin of the older woman is comparable to that of the youngest, No. 7. The hair was rather short and strong. In the back of the head a pad of bird skin was attached where the head rested on the hood. Examination of the fingernails

by the dissecting microscope showed (Fig. 9): 1) the left thumbnail was almost covered by countless cuts from the *ulo* (Woman's knife); 2) the nails of the index and middle fingers on both sides were worn oblique against the midplane; 3) the outermost part of the nails were longitudinally striated, as the superficial layer was worn off; 4) the right index nail was polished; 5) shallow transverse grooves in several nailplates (*Beau's* lines). The examination of the fingernails of this woman showed many marks caused by work: she must have been busily employed until a few days before she died.

## References

- Baran, R. L. 1983. Occupational nail disorders. – In: Adams, R. M. (ed.) *Occupational skin diseases*: 99–109. Grunc & Stratton, New York.
- Lomholt, G. 1959. Favus på Grønland – Ugeskrift for Læger 121: 1383–1386.
- Rook, A. & Ebling, F. J. G. 1979. Hair. – In: Rook, A., Wilkinson, D. S. & Ebling, F. J. G. (eds.) *Textbook of dermatology*, 3rd edition: 1733–1824. Blackwell, Oxford.