coronary artery by the catheter itself, which usually causes immediate appearance of symptoms and electrocardiographic changes. Rapid development of severe left ventricular failure was quite striking involving the left ventricle.

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Tylosis and Intrathoracic Neoplasms*

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The relationship of tylosis (hyperkeratosis palmaris et plantaris) and intrathoracic neoplasms has been cited previously. Two cases are presented, one of whom exhibited the skin manifestations of tylosis coexisting with an extensive squamous cell carcinoma of the esophagus. The second patient demonstrated the skin lesions coexisting with bronchogenic carcinoma. Tylosis has been considered an hereditary cutaneous disorder which seems to be controlled by a single autosomal gene with high penetration and heterozygous effect. The physical findings of tylosis should alert the physician to the possibility of intrathoracic neoplasms as this association is now well documented.

Skin lesions such as the adult type of acanthosis nigricans and dermatomyositis quite often coexist with a malignant tumor. The report by Howell-Evans and associates brought to light the possible association of hyperkeratosis palmaris et plantaris (tylosis) and carcinoma of the esophagus. In another report from England, there was a family with tylosis, sliding hiatus hernia, and one member with carcinoma of the esophagus. This is a report of two patients with tylosis and intrathoracic neoplasms.

CASE 1

This 58-year-old white man entered the University of Wisconsin Medical Center with a six-month history of progressive dysphagia and recent hoarseness. A barium esophagogram demonstrated an obstructing lesion in the upper thoracic esophagus. At esophagoscopy, a fungating tumor was found. Biopsy was performed and a hard palpable scalene node was interpreted as grade 4 squamous cell carcinoma. The patient received 7000 rads during a five-week period with subsequent improvement in his dysphagia.

Six months later he developed pain in his left buttck. A gluteal mass was biopsied and found to be metastatic carcinoma. On this admission, it was observed that he had extremely hyperkeratotic dry palmar and plantar skin. Clinically, this was tylosis. Although this patient had been a farmer, he had not worked for one year prior to admission due to the chronic illness.

This man expired seven months after his initial admission. At postmortem examination, there was an extensive squamous cell carcinoma of the esophagus with metastasis to the cervical, mediastinal, and periaortic lymph nodes, as well as metastasis to the liver, adrenals, lumbar spine and gluteal muscle.

CASE 2

This 49-year-old white woman was admitted to the dermatology service for evaluation of thickness and dryness of the skin of the hands and feet. She also complained of recent weakness of her right arm and leg. For at least ten years, she had dry and rough skin of her elbows, but preceding her admission, the palmar and plantar skin had become thick and dry. A diagnosis of tylosis was made, with probably associated neoplasm. This clinical impression was confirmed by biopsy of the skin of the palm which revealed marked thickening of the corium and moderate acanthosis. The rete pegs were broadened and moderately elongated, and a few chronic inflammatory cells were noted in the upper dermis, consistent with the diagnosis of hyperkeratosis palmaris et plantaris.

Admission chest x-ray examination showed a right peritracheal mass suggestive of a pulmonary tumor. A palpable right supraventricular lymph node was removed and it contained metastatic squamous cell carcinoma. A search was made for the primary tumor, but despite bronchoscopy and esophagoscopy with cytology, gastrointestinal radiographs, an intravenous pyelogram and thorough ENT examination, no definite focus could be found. Skull films and brain scan were interpreted as normal, but the EEG demonstrated an abnormal focus in the left frontal area. With carotid arteriograms, a left frontoparietal mass was seen. The clinical impression was squamous cell carcinoma of the lung with cervical lymph node and cerebral metastasis.

She was given systemic 5-fluorouracil and radiation therapy to the "primary" tumor and metastasis. A short but definite remission was obtained following which there was progressive neurologic deterioration. Despite supportive treatment which included diphenylhydantoin (Dilantin) and

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corticosteroids, in addition to cyclophosphamide (Cytoxan), she expired eight months after her initial admission.

At postmortem examination, squamous cell carcinoma was found in the adrenals, mediastinal lymph nodes, pericardium, and brain. No primary site for the carcinoma could be found following careful examination of the lungs, esophagus, and other organs. The lung was favored as the primary tumor source, since adrenal and pericardial involvement are quite common with bronchogenic carcinoma.

**DISCUSSION**

Tylosis has been considered by some to be an hereditary cutaneous disorder of little consequence. The most prominent clinical features are thickening and fissuring of the palmar and plantar skin (Fig 1 and 2). The degree of involvement may be variable and much more marked on the soles of the feet and thereby be dismissed as a variation of normal. Hereditary tylosis, which seems to be controlled by a single autosomal gene with high penetrance and heterozygous effect, affects both sexes equally without racial predilection. In addition, two types of hereditary tylosis occur, mainly differentiated by the age at onset of the problem and variation in the cutaneous demarkation and degree of fissuring.

The two families initially reported from Liverpool brought to focus the sinister association of familial tylosis and carcinoma. The report of these families noted that “on the average, after the age of 35 years, between 15 and 25 percent of the tyloitic subjects living at the beginning of any five-year period develop the carcinoma within that five-year period. By the age 65, 95 percent of all the tyloitics can be expected to develop carcinoma of the esophagus, provided they do not die from some other cause.”

Our first patient had a definite carcinoma of the esophagus and tylosis. This man, who was single and an alcoholic, felt that his skin was unremarkable and could not recall any other relative having similar skin or carcinoma. A brother was contacted and confirmed the history of absence of cutaneous disorders or carcinoma within the family. The possibility of hereditary tylosis is lacking so this is a case of “acquired tylosis” associated with carcinoma of the esophagus.

The second patient with tylosis is believed to have carcinoma of the lung despite the lack of proof of a primary site of the tumor. One could anticipate that a squamous cell carcinoma of the bronchus and tylosis could exist, since the bronchus, like the esophagus, is a derivative of the foregut. No family history of tylosis could be obtained and the only relative with carcinoma was a brother who died at age 44 of “stomach cancer.” The late onset of hyperkeratosis and lack of a positive family history mediates against hereditary tylosis. This case, as the first, represents “acquired tylosis” in a patient with intrathoracic carcinoma.

Though it is well documented that the incidence of familial tylosis with esophageal carcinoma exists, the possibility of acquired tylosis appearing with intrathoracic neoplasms must be borne in mind. Perhaps what we have observed is an unusual cutaneous manifestation of carcinoma. This physical finding should alert the physician to the possibility of esophageal or bronchial carcinoma in a patient presenting with hyperkeratosis palmaris et plantaris (tylosis).

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**Figure 1 and 2.** Patient with tylosis demonstrating thickness, scaliness, and fissuring of the palmar and plantar skin.