

SUMMARY

THE ARAGONESE MUMMIES OF THE BASILICA OF SAINT DOMENICO MAGGIORE IN NAPLES

The paleopathological study of 31 Italian Renaissance mummies from the Basilica of S. Domenico Maggiore in Naples has allowed us to perform about 20 diagnoses, of which 5 concern infectious (smallpox, hepatitis, condyloma, syphilis and pneumonia), 3 metabolic (obesity, atherosclerosis, gallstones), 1 articular (DISH) and 2 neoplastic (colon adenocarcinoma and skin carcinoma) diseases. The mummy of an anonymous child, dated back to the 16th century (14C: 1569±60), presented a diffuse vesiculo-pustular exanthema. Macroscopic aspects and regional distribution suggested smallpox, while EM revealed many egg-shaped, virus-like particles (250 x 50 nm), with a central dense core. Following incubation with anti-smallpox virus antiserum and protein A-gold complex immunostaining, the particles resulted completely covered with protein A-gold. These results clearly show that this Neapolitan child died of a severe form of smallpox some four centuries ago. The mummy of Maria d'Aragona, Marquise of Vasto (1503-1568), revealed on the left arm an oval, cutaneous ulcer (15x10 mm) with linen dressing. Indirect immunofluorescence with anti-treponema pallidum antibody identified a large number of filaments with the morphological characteristics of fluorescent treponemes. Electron microscopy evidenced typical spirochetes, with axial fibril. These findings clearly demonstrate a treponemal, probably venereal, infection. Further examination of the mummy showed a large pedunculate arborescent neof ormation (2x7 mm) of the right inguinal region, which was rehydrated and submitted to histology by hematoxylin-eosin, Van Gieson and Masson's trichromic staining. Light microscopy evidenced an exophytic, papillary skin lesion, with typical connective axis and pronounced parakeratosis. These macroscopic and histological aspects seemed peculiar of condyloma acuminatum, a papillomavirus-induced squamous lesion also called "venereal wart". Molecular study revealed the presence of HPV 18, a virus with high oncogenic potential. Automated sequencing of several clones revealed 100% similarity sequences of both HPV 18 and JC9813 DNA, a putative novel HPV with low oncogenic potential. This study represents the first molecular diagnosis of HPV in mummies and could pave the way for further research about the secular evolution of these viruses, very important in human oncology. The buccal surfaces of the teeth of Isabella d'Aragona, duchess of Milan ((1470-1524), covered by a black patina with high mercury levels, have been intensively and intentionally abraded. The black patina can be attributed to chronic mercury intoxication, used therapeutically in the treatment of syphilis. The mummy of Ferrante I d'Aragona, King of Naples (1431-1494), revealed an adenocarcinoma extensively infiltrating the muscles of the small pelvis. A molecular study of the neoplastic tissue evidenced a typical mutation of the K-ras gene codon 12: the normal sequence GGT (glycine) was altered into GAT (aspartic acid). At present this genetic change is the most frequent mutation of the K-ras gene in sporadic colorectal cancer. The alimentary "environment" of the Neapolitan court of the XV century, with its abundance of natural alimentary alkylating agents, well explains this acquired mutation.. These and other diseases as, for example, a case of cirrhosis, some cases of anthracosis and other peculiar traumatic conditions, such as a mortal stabwound, can elucidate the pathocenosis of this wealthy classes of the Italian Renaissance.