

## The Computed Tomography of two Mummies from Ancient Egypt

Veronica Macchi<sup>1</sup>, Andrea Porzionato<sup>1</sup>, Massimo Favat<sup>2</sup>, Claudia Gambino<sup>3</sup>, Sandro Benetti<sup>2</sup>, Cinzia Oliva<sup>4</sup>, Matteo Crosera<sup>5</sup>, Paola Zanovello<sup>6</sup>, Emanuele Ciampini<sup>7</sup>, Raffaele De Caro<sup>1</sup>

<sup>1</sup> Istituto di Anatomia Umana, Dipartimento di Neuroscienze, Università di Padova, Padova, Italia

<sup>2</sup> Radiology Department, Azienda Ulss 5, Rovigo, Italia

<sup>3</sup> Progetto Egitto Veneto, Università di Venezia, Venezia, Italia

<sup>4</sup> Venaria Reale, Università di Torino, Torino, Italia

<sup>5</sup> Arcadia Arte srl, Arcadia Arte srl, Venezia, Italia

<sup>6</sup> Dipartimento Dei Beni Culturali: Archeologia, Storia Dell'arte, Del Cinema E Della Musica (Dbc), University of Padova, Padova, Italia

<sup>7</sup> Dipartimento di Studi Umanistici, Università ca Foscari, Venezia, Venezia, Italia

In forensic clinical anatomy an objective non-destructive documentation of the body surface and of the interior of the body is given by computed tomography (CT), which is used in post-mortem radiological investigation. This technique is also applied in mummy studies, with the aim of providing a permanent record of the mummy's features. For the exhibition "L'Egitto Ritrovato", promoted by Fondazione Cassa di Risparmio di Padova e Rovigo, in Rovigo, more than 500 pieces of the entire Valsè Pantellini Collection of the Accademia dei Concordi of Rovigo have been showed. In particular two original mummies, one of a young woman, and the second of a child, underwent a process of a survey and restoration, which was conducted in such a way as to be visible also by visitors. A whole-body CT was performed on the two mummies. The CT examination showed the preservation of skeleton and documented the presence of conservative material inside the bodies, as well as the sites of incision to remove the organs. In fact the artificial mummification had the aim to preserve that person's morphologic features by delaying or arresting the decay of the body. The ancient Egyptians used to eviscerate the bodies, followed by desiccation with natron (a compound of sodium salts) to halt putrefaction and prevent rehydration. CT demonstrated to be a non-destructive method to investigate mummies, in order to acquire data on the individual anatomy and the preservation of the body. It allows for non-invasive insight, revealing detailed information about the mummy's sex, age, constitution, injuries, health, and mummification techniques. Moreover, CT allows not only the acquisition of sectional images but also, thanks to dedicated software, the post-processing and reconstruction of three-dimensional models, that can be used also for public displays.

### Key words

Computed tomography, Mummies, Forensic clinical anatomy.