Craniofacial custom implants following oncologic surgery of anterior skull base tumors

Malignant tumors of the nasal cavity and paranasal sinuses constitute approximately less than 1% of all malignant tumors and occur predominantly in the 5th to 6th decade. They are most commonly found in whites, with the incidence in males being twice that of females. Examples of these include esthesioneuroblastoma, sinonasal carcinoma, adenocarcinoma, squamous cell carcinoma, neuroendocrine carcinoma, sarcoma, chondrosarcoma, and other sinonasal malignancies1. The goal of surgery, in this malignancies, is an oncological en bloc resection defined as the lesion plus normal margin. Current combined approaches with adjuvant radiation therapy have increased 5-year disease-free survival rates to at least 50%, demonstrating 5-year survival rates of up to 70% to 80%2.

Resective surgery often leave important craniofacial defects with subsequent aesthetic and functional problems. Soft tissues defects are conventionally closed with different types of flaps (local, myocutaneous or free) while osseous defects are treated with autologous bone transplantations or polymethylmethacrylate bone cement3. Both these methods require intraoperative modeling and show a significant rate of complications such as inflammations or resorption. Custom implants are a relatively recent method of reconstruction. They are based on the osseointegration between titanium and bone by means of endosseous screws. The preoperative evaluation of skull bones and their deformities are usually obtained with a computed tomography scan that allow sufficient data to create preoperatively the implant from patients’ peculiar anatomy. Long-term aesthetic results are more satisfactory than previous techniques (Figures 1 and 2).

References


G. Gravante, F. Araco*, V. Cervelli+, P. Gentile*, D. Delogu, A. Araco*

General Surgery Department, University of Rome Tor Vergata – Rome (Italy)
*Crown House Hospital, Oldbury – Birmingham (United Kingdom)
+Department of Plastic Surgery, University of Rome Tor Vergata – Rome (Italy)
*University “La Sapienza” – Rome (Italy)

Corresponding Author: Gianpiero Gravante, MD; e-mail: ggravante@hotmail.com
Figure 1. Sixty-four years-old patient affected by an orbital squamous cell carcinoma (craniofacial resection in October 2002). Left upper panel: preoperative view. Right upper panel: postoperative result. Left lower panel: Computed tomography analysis of the skull defect (right arrow). Right lower panel: intraoperative picture of the implant.
Figure 2. Forty-eight years-old man affected by an ethmoid adenocarcinoma involving the orbit and medial wall of the cavernous sinus (resection in August 2003). Left upper panel: preoperative view. Right upper panel: postoperative result with normal position of the eye. Left lower panel: titanium screws used for implant fixation. Right lower panel: intraoperative picture of the implant.