Available online at www.sciencedirect.com

SciVerse ScienceDirect

journal homepage: www.elsevier.com/locate/jobcr

Editorial

Can technology conquer biology in craniofacial surgery for malignant tumors

It is over half a century ago, that craniofacial surgery was introduced as a technical advance to resect malignant tumors of the nasal cavity and or paranasal sinuses, involving the anterior skull base. This revolutionary and aggressive surgical approach lead to significant improvement in cure rates of these otherwise devastating tumors with dismal outcomes. Surgical resection was now feasible in the “no man’s

land”, without the fear of CSF leakage, meningitis and death. Cure rates of these complex and advanced tumors (malignant tumors of the paranasal sinuses involving the anterior skull base), were more than doubled. Various refinements in surgical techniques were developed, and reported in the literature, over the next three decades, improving the safety of the operation and reducing the morbidity from these heroic operations. However, the outcomes in terms of disease free survivorship remained stable. This extra ordinary progress was made in the era, when pre operative assessment of the extent of the tumor was done by imaging studies, limited to old fashioned conventional tomograms. By modern day imaging standards, this could hardly be considered adequate.

Introduction of precise anatomic imaging modalities, such as CT, MRI, 3-D reconstructions, and angiographic techniques, allowed accurate delineation of the extent of tumors, to facilitate pre operative case selection, and achieve a complete resection, but inspite of this, tumor control rates remained relatively unchanged. While gross total resection could be anticipated preoperatively, microscopic positive margins remained a problem, leading to local recurrences, treatment failures and unchanged outcomes. Review of large international databases, identified predictors of prognosis, such as tumor extent and histology as well as status of margins of resection as the most important independent prognostic factors. These biological features of the tumors remained the supreme predictors of outcome inspite of, superior pre

operative imaging assessment, safer surgical techniques, and reduced operative morbidity and mortality. Some of these prognostic predictors, however did allow better case selection.

The last two decades have seen meteoric rise in technological developments, including real time intra operative imaging, neuro navigation, endoscopic and robotic instrumentation and thus application of minimally invasive, endoscopic and robotic techniques for surgery of tumors in these anatomically complex and technically difficult locations. While technically safe conduct of these minimally invasive techniques is feasible in selected cases, avoiding external incisions and operative morbidity, it’s effectiveness in improved tumor control should be the ultimate goal. In addition, these technological developments are applicable in only a handful of selected cases with favorable histology, and limited tumor extent. Certainly, for those patients, these techniques are applicable, and may be considered in expert hands. Whether, oncologic effectiveness of these minimally invasive techniques are comparable to open operations remains to be shown in well controlled matched trials. Until such data is available, these minimally invasive new technologies in craniofacial surgery for malignant tumors should be employed with caution.

While technology has made major strides in tackling these tumors, it’s impact on outcomes of treatment remains unchanged. Ultimately, it is the biology of the disease, which remains the main predictor of outcome. Thus the ultimate challenge is to make advances in basic research in oncogenomics to develop molecular markers which can predict and alter the biology of these tumors if we are to make progress in the outcomes of patients with malignant tumors involving the skull base.

Jatin P. Shah

Professor of Surgery, E W Srong Chair in Head and Neck Oncology,
Memorial Sloan Kettering Cancer Center, New York, NY, USA
E-mail address: shahj@MSKCC.ORG

2212-4268/\$ – see front matter

Copyright © 2013, Craniofacial Research Foundation. All rights reserved.

<http://dx.doi.org/10.1016/j.jobcr.2013.05.001>