**8557** POSTER

**Hypoxic tumour characteristics evaluated by fluorine-18-labeled fluoromisonidazole positron emission tomography in head and neck cancer**

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**Background:** Tumor hypoxia is an important determinant of locoregional control from radiation therapy. In this study, we demonstrate a way of defining hypoxic tumor volume (HTV) by using fluorine-18-labeled fluoromisonidazole positron emission tomography/computed tomography ($^{18}$F-FMISO PET/CT) in head and neck cancer patients and evaluate hypoxic tumor characteristics by comparing with other tumor characteristics and clinical outcome after treatment.
**Materials and Methods:** Twenty-six newly diagnosed head and neck cancer patients were enrolled prospectively. All patients had undergone CT or MRI of head and neck, fluorodeoxyglucose (FDG) PET/CT and $^{18}$F-FMISO PET/CT before any treatment. From these imaging studies, sizes of primary tumors and metastatic lymph nodes, gross tumor volumes (GTV) and metabolic tumor volumes (MTV) were measured and obtained. The HTV was defined by using the tumor-to-cerebellum ratio (T/C) of 1.3 as a threshold from $^{18}$F-FMISO PET/CT. Hypoxic tumor fraction (H/G) was calculated by defining as hypoxic-to-gross tumor volume fraction. These tumor volume characteristics were analyzed to find out whether they had correlations with each other and were evaluated with the clinical outcomes in patients who had received definitive radiation therapy.
**Results:** The mean hypoxic tumor fraction (H/G) was 18.3±23.4%. It was significantly correlated with the size of metastatic lymph nodes ($p = 0.020$), but not with the size of primary tumor or GTV. Patients with higher maximal standard uptake value (mSUV) in $^{18}$F-FMISO PET or FDG PET, had significantly larger hypoxic tumor fraction. Although the number of patients was small, patients with pharynx origin cancer had significantly ($p = 0.003$) lower hypoxic tumor fraction than with paranasal sinus or larynx origin. Also, the hypoxic tumor fractions were significantly lower in patients who had gained complete response than had shown partial response after definitive radiation therapy ($p = 0.001$). However, no significance was found between the hypoxic tumor fraction and local failure.
**Conclusions:** We described a way of defining hypoxic tumor volume with $^{18}$F-FMISO PET/CT. Although there may be limitation due to small number of patients, our result provides the understanding of hypoxic tumor characteristics in head and neck cancer patients and could be useful when concerning hypoxia-guided intensity modulated radiation therapy.

**8558** POSTER

**Microinvasive access to the visceral autoflaps for microsurgical reconstruction in head and neck cancer patients**

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**Background:** Microinvasive diagnostic and surgery is one of the most promising lines of up-to-date oncology. In the P.A. Hertzen Moscow Cancer Research Institute was developed a method of microinvasive abdominal access to form the visceral autoflaps in cancer patients.
**Methods:** We have an experience of treatment 44 patients aged from 16 to 55 years (male 17, female 26) with malignant local spreaded craniofacial (24) and oropharyngeal tumors (20).
In 14 cases it was the tumor of the scalp, 5 – maxilla, 5 – cellulae ethmoidales, 4 – oral cavity, 5 – tongue, 3 – oropharyngeal, 2 – laryngopharyngeal, 1 – face soft tissues sarcoma, 1 – mandible, 4 – parotid gland. For plastic closing the large postoperative defect were used the abdominal organs. We chose Para umbilical incision as the appropriate access to the abdominal cavity with minimal external trauma of the anterior abdominal wall. Using video assisted technique (video endoscopy system) aponevrosis was dissected along median centerline. Donor's organs (omentum, greater curve of the stomach, transverse colon) were delivered through the minilaparotomy wound on the anterior abdominal wall, then vessel's peduncle of free flap was exposed (right gastroomental vessels, vessels colicae media) and visceral autoflap was formed. Dissection away the transplant followed by the extracorporeal forming of the organs' anastomozis. In 3 cases was made an attempt to form the 1 gastroomental and 1 colon-omental autoflaps and in 1 case at adiposity during formation omental flap. After inspection the abdominal cavity usual upper median laparotomy was performed. The massive commissural process in the abdominal cavity caused the widening of the access. The plan of the operation among these 3 patients was fulfilled; the flaps were formed and transported on recipient's wound.
**Results:** In 41 cases the operation was completely made through the minimal access (4 patients had abdominal operative intervention before). It was formed and prepared for autotransplantation 23 omental free flaps, 4 gastroomental and 14 colon-omental flaps. There were no intra- and postoperative abdominal complications. Based on the results of clinical and morphological data comparison there were no reliable feature of any structural and functional changes of gastric and omental flap mucous. The follow up period was up to 1 year.
**Conclusion:** Microinvasive technology to form visceral autoflaps for head and neck reconstruction allows to minimize operative trauma and to shorten the period of post-surgical treatment. We recommend using this access when operating the weak cancer patients and young women to avoid additional undesirable scar on donor's site.

**8559** POSTER

**Treatment of T2N0−1 laryngeal cancer (LC) with hyperfractionated radiotherapy (HRT) and cetuximab**

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**Background:** Local control rates for T2 LC with HRT alone at the Instituto Angel H. Roffo are about 61%, increasing to 75−80% with salvage surgery. The addition of cetuximab to HRT significantly enhanced the local control and survival rates compared with HRT alone, with similar reported toxicities to locally advanced head and neck cancer. Cetuximab was added to HRT for the treatment of T2N0−1 LC with the primary objective of enhancing local control rates and the secondary objective of extending the time free of laryngectomy (TFL) for T2 LC.
**Materials and Methods:** Twenty patients (pts) (19 male;1 female; median age 64 years) with T2 LC were enrolled. Two pts (10%) had N1 tumors that were 65% glottic and 35% supraglottic. Pts received HRT to a total dose of 76.8 Gy over 6.5 weeks. Cetuximab was administered at 400 mg/m$^2$ one week before HRT followed by 7 weekly doses of 250 mg/m$^2$. Pretreatment evaluation consisted of a CT scan and fibrolaryngoscopy (FLC) and toxicity assessments were performed weekly. After treatment, pts were evaluated monthly during the first year and then every three months with FLC. All pts signed an informed consent and the trial was approved by the institutional review board and submitted to the country's medical authorities.
**Results:** Eighteen pts (90%) completed HRT, receiving a median HRT dose of 76.7 Gy over a median 7-week duration, and 17 pts (85%) received 8 doses of cetuximab. The median duration of treatment was 8 weeks. At end of treatment, a complete response (CR) was reported in 16 pts (80%), 3 pts (15%) had persistent disease and all 3 had surgery. Four pts with CR relapsed at a median time of 9 months and received surgery. To date, after a median follow-up of 15 (range 6.7−⩾29) months, 18 pts (90%) are disease-free; 12 (66%) of whom did not require a laryngectomy. Median TFL for all the pts was 17 (range 6.7−⩾29) months. Grade 3/4 toxicities were reported for stomatitis (6 pts), acne-like rash (4 pts), radiation dermatitis (5 pts) and dysphagia, diarrhea, vomiting, fatigue, skin infection and pneumonia (1 pt each). Six pts (30%) were admitted to hospital due to toxicity and 2 pts (10%) died; 1 with a sudden death not related to cetuximab and 1 due to progressive disease at 15 months.
**Conclusions:** Treatment according to protocol was administered to 85% of pts. CR, disease-free survival and TFL rates were higher than historical rates at the Instituto Ángel H. Roffo when pts with T2N0−1 LC received cetuximab in addition to HRT.

**8560** POSTER

**Dosimetric changes of intensity modulated radiotherapy (IMRT) plan on the follow-up CT acquired during treatment in the patients with nasopharynx cancer**

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**Background:** To evaluate the dosimetric changes of intensity modulated radiotherapy (IMRT) plan on the follow-up CT scan acquired during treatment in the patients with nasopharynx cancer.
**Methods and Materials:** Sixteen patients with nasopharyngeal cancer underwent follow-up CT scan during the treatment according to their treatment response after they received 30−50 Gy of RT. Seven port IMRT