Accuracy of MRI in predicting absence of fixation of head and neck cancer to the prevertebral space

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• Dx and Staging of H&N cancer accurately by endoscopic visualization: superficial ca.
cross-section image: submucosal ca.
• Prevertebral space involvement: fixation to or direct invasion of the prevertebral fascia→poor prog.
• Specifically addressed the role of MRI in selecting patients who were operative candidates
Patients and methods

• Retrospectively review: 1993-1998
• Oropharyngeal ca. (n=58); hypopharyngeal ca. (n=11); laryngeal ca. (n=6)
• T3 or T4 squamous cell carcinoma
• 45 Men and 30 women
• Mean age: 65 y/o (range 38-77 y/o)
Patients and methods

• MRI image reviewed independently and blindly by two neuroradiologists
  Evaluated for the presence of preservation of the retropharyngeal fat between the tumor and the prevertebral musculature

• ENT surgeon use manual manipulation assess fixation of tumor to the prevertebral fascia

• Head and neck pathologist analyzed the final histologic findings of the resected specimens for adequacy of tumor margins
Images
Results

- 40 patients: preservation of the retropharyngeal fat plane (MRI)
  38 patients: sagittal images; 32 patients: axial plane; 30 patients: both

- 40 patients: prevertebral longus muscle complex with normal appearance
Results

• Intraoperative assessment: no fixation of tumor to prevertebral fascia in 39 of 40 cases; resectable with macroscopic tumor-free surgical margins

• Pathology: 39 cases, histologically tumor-free surgical margin

• One false negative: delay 4-weeks between the time of imaging and surgery
Discussion

- Prevertebral compartment: ant. Longus capitus m. and rectus capitus m.
- Retropharyngeal fat: post. to pharyngeal mucosa and ant. to prevertebral space
- Determination of tumor fixation to the prevertebral compartment by panendoscopy or open exploration
Discussion

• CT and MRI have critical role in staging
• Example: tongue base ca. or epiglottic ca.

  pre-epiglottic space invasion: supraglottic laryngectomy

  paraglottic space invasion: largectomy

  nodal metastasis, thyroid cartilage invasion, encasement of carotid a.,
  detect perineural spread, invasion of mandible, skull base and brachial
  plexus: inoperable
Discussion

- Righi et al (1996): retrospective study, accuracy of CT in predicting prevertebral m. invasion: 55%
- Loevner et al (1998): accuracy of MRI in predicting fixation of the tumor to prevertebral compartment by assessment of prevertebral lougus m.: 53 ~ 60%
- To identify those patients whose disease was inoperable - identify who were operative candidates
Conclusion

- Preservation of the retropharyngeal fat plane on MRI reliably predicts those patients whose tumors are resectable