

Is gadolinium injection always relevant during the MRI follow-up of non-functioning pituitary macroadenomas (NFPMA)s?

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Objective : To evaluate the concordance between coronal T2 and coronal T1 injected sequences in the detection of possible adenomatous progression during the MRI follow-up of NFPMA.s

Patients and Methods :

- Single-center retrospective study including all MRIs of patients with NFPMA.s who had at least two MRIs, including one between 2015 and 2019 (106 patients, 680 MRIs)
- For each patient, longitudinal T2 and T1 injected follow-up was analyzed separately :
 - 1: Visual detection of areas appearing to evolve during follow-up
 - 2: Evolution quantified by the measurement of two orthogonal diameters (fig.1)

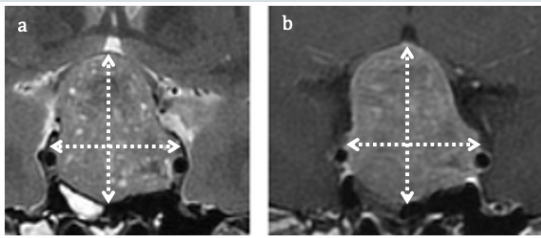


Fig.1: Example of NFPMA diameter measurements in coronal T2 (a) and T1 injected (b)

- Second reading on a sample of 100 MRIs
- Progression if one diameter increase > 2 mm between two MRI
- Evaluation of the 3 and 4 mm thresholds

Results :

- Concordance of **93.1%** (540/580) between the two sequences on all the MRIs of the follow-up
- **80.5%** (467/580) of the MRIs were stable with 100% agreement between the two sequences, especially in cases of complete surgical resection (Fig. 2)

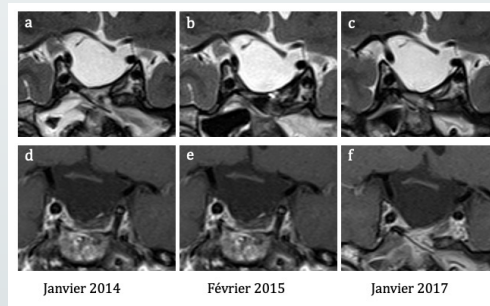


Fig.2: Perfect concordance between the two sequences during the follow-up of this postoperative empty sella turcica

- In cases of possible progression (113/580, 19,5%), concordance of:
 - 64.4% (73/113) for a threshold of 2 mm
 - 87.7% (57/65) for a threshold of 3 mm
 - 97.1% (33/34) for a 4 mm threshold

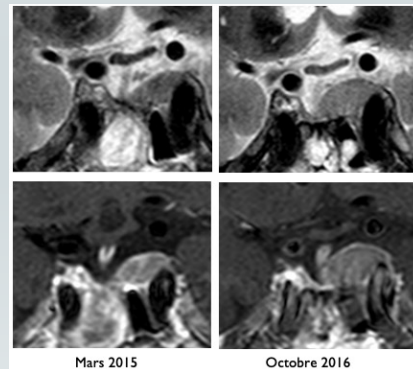


Fig.3: Concordant progression between the two sequences

- Discordances between the two sequences mostly observed in MRIs performed between 3 and 6 months postoperatively
- The interobservers reproducibility of the measurements was good to excellent

Discussion :

- **93.1%** of concordance between coronal T2 and T1 injected sequences on all the MRIs of the follow-up
- Important number of MRIs for which injection does not seem essential
- **Limits :**
 - Retrospective study but the largest series reported on this subject
 - MRIs provide from different centers but the majority were performed in our institution with a standardized coronal slice plane
 - Only coronal slices were analyzed because no T2 sagittal was available
 - No gold standard to confirm progression => interest of a prospective study

Conclusion:

- 93.1% of concordance between the coronal T2 and T1 injected sequences on all the MRIs of the follow-up
- **Interest of a non-injected protocol in first intention (coronal and sagittal T1 and T2) except in case of recent surgery (< 6 months) and for the follow-up of aggressive lesions**