Tailoring reports to clinicians' needs: Use of structured templates to categorize intracranial metastases treated with radiotherapy
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Introduction

- Characterization of intracranial metastases following radiation therapy presents a uniquely challenging task for radiologists
- Patients with multiple lesions may have combination of:
  - Successfully treated metastases
  - Progressive disease
  - Indeterminate findings
- Interpretation of such studies requires intensive research into patients' histories and comparison with prior examinations
- As such, radiology reports are frequently nonspecific
  - Lack sufficient clarity to be of use to referring physicians

Study design

1. Implement and disseminate a structured report template for use in patients with intracranial metastases status post radiation therapy
2. Compare the precision with which radiology reports were written before and after template initiation

Materials and Methods

- Report template categorized lesions as one of 3 entities:
  - "New metastasis": new enhancing lesion remote from treatment site
  - "Treated metastasis": Stable or decreased size of previously treated lesion
  - "Indeterminate, disease progression treatment related changes": Increased size of previously treated lesions
- Findings section of report included areas for pertinent findings:
  - Date(s) of prior radiosurgery
  - Date(s) of prior surgical resection
  - Presence of absence of leptomeningeal involvement
- Following initiation of the report template, a retrospective review was performed of all patients with known metastases who underwent MR imaging between 1/1/2017 and 2/26/2018; dichotomized into "pre" and "post" template initiation

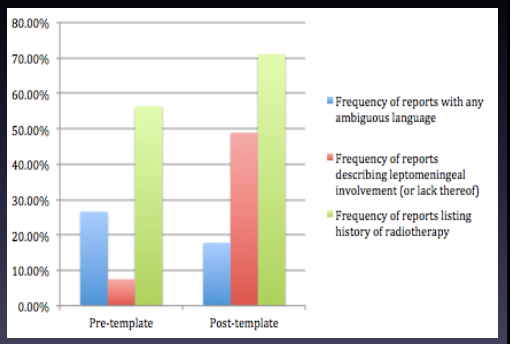
Materials and Methods, cont'd

- Reports were assessed for *appropriate* or *inappropriate/ambiguous* descriptions
- *Appropriate* language characterized findings as "new metastasis", "treated metastases" or "indeterminate/possible radiation necrosis versus increased size of metastasis"
- *Inappropriate/ambiguous* language inadequately described findings: e.g. "increased size of metastatic lesion", "stable enhancing foci", etc.
  - When possible, ambiguous descriptions were sub-divided into one of the pre-defined categories (e.g. "stable enhancing foci" was considered an ambiguous description of "treated metastases"

	Acceptable/appropriate language	Inappropriate/ambiguous language examples
New enhancing foci, remote from treatment areas	**"New metastases" "Progressive disease"**	• New enhancing foci
Stable or decreased size of treated lesion	**"Treated metastases" "Positive treatment effect"**	• Stable enhancing foci
Increased size of treated lesion	**"Indeterminate, may represent increased size of metastasis and/or radiation necrosis"**	• Increased size of enhancing foci • Increased size of metastasis

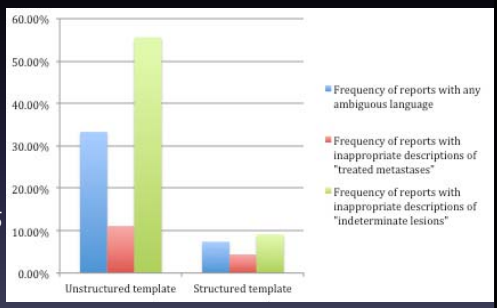
Results

- Of 150 enrolled, patients, 139 were included; 88 female (63.3%); average ages pre- and post template: 59.4 ± 12.0 and 61.6 ± 10.4
  - 94 (67.6%) in pre-template period, 45 (32.4%) in the post-template period
- *Inappropriate/ambiguous* language:
  - In 25 reports (26.6%) pre-template
  - 8 reports (17.8%) post-template
- Leptomeningeal enhancement (or lack thereof):
  - In 7/94 (7.5%) of pre-template
  - 22/45 (48.9%) post-template
- History of radiotherapy:
  - In 53/94 (56.4%) pre-template
  - 32/45 (71.1%) post-template



Results, cont'd

- "Indeterminate" lesions inappropriately described:
  - 13/32 (40.6%) of reports pre-
  - 6/20 (30.0%) post-template
- "Treated metastases" inappropriately described"
  - 13/74 (17.6%) pre-
  - 2/32 (6.3%) post-template
- None of the reports inappropriately described new metastases
- Following initiation of the template, 27/45 (60.0%) of reports used the structured template
- Inappropriate/ambiguous language:
  - In 2/27 (7.4%) of reports that used the template
  - 6/18 (33.3%) of the unstructured reports



Results, cont'd

- Comparing reports written pre- and post-template dissemination:
  - No difference in overall use of inappropriate language (p=0.52)
  - Significantly more descriptions of leptomeningeal involvement (p<0.0001) and prior radiation therapy (p=0.0005)
- Comparing reports in the post-template period:
  - Reports that used the template had significantly less ambiguous language (p=0.02)

Discussion/conclusion

- Use of a structured report template led to improved categorization of intracranial metastases treated with radiotherapy
- However, no significance difference was found in the overall use of ambiguous description of lesions before and after dissemination of template
  - Likely related to poor compliance/use of the template
- Although structured templates may be beneficial in the appropriate setting, radiologist preference of free prose text may be a roadblock
- Ultimately, use of free-text and/or structured reports may depend on the clinical scenario and preferences of referring doctors and radiologists

Limitations

- Retrospective
- Small patient cohort
- Relatively short time (10 days) allowed for dissemination of the report template
  - Suboptimal compliance may have been partially related to short transition period
- Radiologist satisfaction not assessed
  - Hence, uncertain if non-compliance was due to preference or lack of awareness