Quality of the Patient Experience During Radiosurgery: Measurement toward Improvement

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New York University
“HOWEVER, THE ASSOCIATION BETWEEN PROCESS MEASURES AND PATIENT OUTCOMES IN SURGICAL PATIENTS HAS NOT BEEN WELL DEFINED.”

Determining the elements of procedural quality

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Object. The definition and determination of quality health care is an important topic. The purpose of this study was to develop a longitudinal method to define a quality procedure by creating a formal approach to pre- and postoperative outcomes documentation. The authors worked to define quality outcomes by first documenting the patient’s condition. Goals were determined together by the surgeon and the patient and then were evaluated to see if those goals were met.

Methods. The population consisted of cancer patients with newly diagnosed metastatic brain disease who were scheduled to undergo stereotactic radiosurgery. Surgeons recorded perioperatively objective information related to preoperative goals, clinical findings, surgical performance and/or error, and whether goals were met. In addition, patients completed pre- and postprocedure questionnaires (Rand 36-Item Short-Form Health Survey 1.0 [SF-36]).

Results. Procedural goals, defined as completing radiosurgery without error or complication and same-day discharge, were met in all patients. The clinically predetermined goal of tumor palliation was met in all but 1 patient at follow-up. The SF-36 scores remained stable except for the general health domain, which was lower (p = 0.006).

Conclusions. Procedural goals can be defined and objectively measured serially. The authors think that quality care can be defined as a process that achieves predefined goals without significant error and maintains or improves health.

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Key Words • brain metastasis • radiosurgery • error • quality • oncology
Regardless of the outcome, a pleasant or unpleasant patient experience is what they recall.
technology you can trust

Clinically proven, PinPoint makes procedures easier for everyone from therapist to oncologist, while keeping the patient as comfortable as possible. Every element and feature of PinPoint has been precisely engineered and rigorously tested to meet the high accuracy requirements of SRS.

The Vacuum Fixation Mouthpiece is the key to PinPoint’s sub-millimeter accuracy. The mouthpiece is custom formed for each individual patient creating an exact fit to the roof of their mouth. Vacuum suction seals the mouthpiece precisely into place. No active participation from the patient is required.
A Pinpoint Beam Strays Invisibly, Harming Instead of Healing

By WALT BOGDANICH and KRISTINA REBELO
Published: December 28, 2010

The initial accident report offered few details, except to say that an unidentified hospital had administered radiation overdoses to three patients during identical medical procedures.

It was not until many months later that the full import of what had happened in the hospital last year began to surface in urgent nationwide warnings, which advised doctors to be extra vigilant when using a particular device that delivers high-intensity, pinpoint radiation to vulnerable parts of the body.

Marci Faber was one of the three patients. She had gone to Evanston Hospital in Illinois seeking treatment for pain emanating from a nerve deep inside her head. Today, she is in a nursing home, nearly comatose, unable to speak, eat or walk, leaving her husband to care for their three young daughters.

Two other patients were overdosed before the hospital realized that the device, a linear accelerator, had inexplicably allowed radiation to spill outside a heavy metal cone attachment that was supposed to...
Titanium mesh cranioplasty

Multiple atypical meningiomas
“much more comfortable than I thought”

Anterior clinoid meningioma, acrylic bifrontal cranioplasty

6 months

4 days
General anesthesia can be pleasant for the patient
Commonly Used Medications

- Ativan: Sedative/hypnotic; anti-anxiety
- Midazolam: Sedative/hypnotic
- Fentanyl: Narcotic Analgesic
- 0.5% Lidocaine: Local Anesthetic
- 0.5% Marcaine: Local Anesthetic
- Sodium bicarbonate buffer (4ml of 8.4% solution)
- Narcan: Opioid Antagonist
- Romazicon: Benzodiazepine Receptor Antagonist
Inserting the intravenous line can be challenging and uncomfortable for some patients.
Topical lidocaine cream
Lidocaine cream, then 25 gauge needle
Methods

1. Intravenous line placement
2. Delivery of sedation
3. Application of the head frame
4. Undergoing MRI
5. Having radiosurgery on the gamma knife bed
6. Removal of the head frame
7. Communication with caregivers
8. Knowing what to expect before radiosurgery

Survey by NP 30-60 minutes post procedure
Methods

Cohort #1

100 patients
Female = 52
Mean age 61 (32-86)
45 had undergone prior radiotherapy (15 cranial)
17 had worn a mask for radiotherapy before
45 had received prior chemotherapy
73 had undergone prior major surgery of some kind
Cohort #1 = no sodium bicarbonate mixed with local anesthetic

Adequate sedation = 89
Inadequate sedation = 4
No sedation = 7

All 100 felt comfortable before frame application and all later remembered frame application.
<table>
<thead>
<tr>
<th>Item</th>
<th>Very Comfortable</th>
<th>Adequately Comfortable</th>
<th>Minimally Uncomfortable</th>
<th>Very Uncomfortable</th>
<th>Mean</th>
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<tbody>
<tr>
<td>Intravenous (IV) Placement</td>
<td>1 (69)</td>
<td>2 (22)</td>
<td>3 (5)</td>
<td>4 (2) N/A (2)</td>
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<td>1 (83)</td>
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<td>3 (0)</td>
<td>4 (0) N/A (0)</td>
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<td>2 (38)</td>
<td>3 (18)</td>
<td>4 (9) N/A (0)</td>
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<td>Completing the MRI</td>
<td>1 (66)</td>
<td>2 (27)</td>
<td>3 (3)</td>
<td>4 (4) N/A (0)</td>
<td>1.4500</td>
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<tr>
<td>Having radiosurgery on the Gamma Knife bed</td>
<td>1 (89)</td>
<td>2 (10)</td>
<td>3 (0)</td>
<td>4 (1) N/A (0)</td>
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<td>1 (64)</td>
<td>2 (20)</td>
<td>3 (15)</td>
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<td>1.5300</td>
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<td>Communication with caregivers</td>
<td>1 (99)</td>
<td>2 (1)</td>
<td>3 (0)</td>
<td>4 (0) N/A (0)</td>
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<td>Knowing what to expect beforehand</td>
<td>1 (85)</td>
<td>2 (12)</td>
<td>3 (3)</td>
<td>4 (0) N/A (0)</td>
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## Table 2

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<td>3 (1)</td>
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<td>4 (0) N/A (0)</td>
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<td>Knowing what to expect beforehand</td>
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<td>2 (4)</td>
<td>3 (1)</td>
<td>4 (0) N/A (0)</td>
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<td>Count (n)</td>
<td>Percentage</td>
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<tr>
<td>Minimally uncomfortable</td>
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<tr>
<td>Very uncomfortable</td>
<td>9</td>
<td>7%</td>
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</tbody>
</table>
Nursing Care (n=125)

All patients rated their nursing care as excellent.

Length of Procedure (n=125)

“shorter than expected” = 72
“as expected” = 41
“longer than expected” = 11
Patient Suggestions!

“Improving the procedure” (without re-explaining the value of each part)

“eliminate the head frame” = yes – 72, no - 51, no response -2
“eliminate the imaging” = yes - 26, no - 97, no response -2
“eliminate the gamma knife machine” = yes - 16, no - 106, no response -3
Summary

Evaluating your own patients provides insight.

Intravenous sedation with propofol is very comfortable.

Sodium bicarbonate has a mild effect on frame application comfort.

Patient education is crucial.
The Boehm Foundation Fellowship in Gamma Knife Radiosurgery at NYU

A fully funded clinical and research fellowship to train new leaders in the field

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