

How to Treat a Glioblastoma-Multiform Patient with Gross Residual Tumor after Craniotomy

Case Number: RT2008 – 09 (M)

Potential Audiences: Intent Doctor, Oncology Special Nurse, Resident Doctor

Purpose: To discuss the treatment modality for a case of GBM patient with gross residual tumor after craniotomy

Scenario: You are radiotherapy (RT) Intent Doctor/Special Nurse/Resident Doctor, and you are assigned to evaluate the following patient before visiting of your RT attending physician. Please review the following description carefully; your RT attending physician will visit this patient later and discuss with you after your review.

Case Presentation:

This 50-year-old female patient, 江 OOO, was referred to us for radiotherapy assessment for ‘Glioblastoma Multiform post surgery resection (2007/11/19)’.

S:

1. In 2007/11, she was sent to local hospital for symptoms of abnormal working ability. Brain MRI showed a huge brain tumor with size more than 6 cm over the left frontal lobe.
2. On 2007/11/19, craniotomy with tumor resection was done, and pathology reported glioblastoma multiform.
3. On 2007/11/29, you visit this patient in the ward.

Histories: no prior major medical disease

Review of systems: abnormal working ability and mood change before craniotomy; no more these symptoms post craniotomy now

O:

1. General Condition: ECOG: 1, sitting on bed, easy looking, speech: relatively OK
2. Physical Examinations:
 - (1). HEENT & SCF: a scalp surgical scar in place just removal of stitches today
 - (2). CHE: neg.
 - (3). ABD: neg.
 - (4). Back & Spine: neg.
 - (5). Extremities: free movement and full muscle power, no numbness
 - (6). Cranial nerve: OK
3. ***Pathology in 2007/11, left frontal tumor, total resection: glioblastoma multiform
4. Images:
 - (1). CXR in 2007/11: neg.
 - (2). MRI in 2007/11, other clinic: a huge multi-cystic mass lesion over the left frontal lobe.
5. Others: neg.

Key Image(s):

Fig. 1. CXR

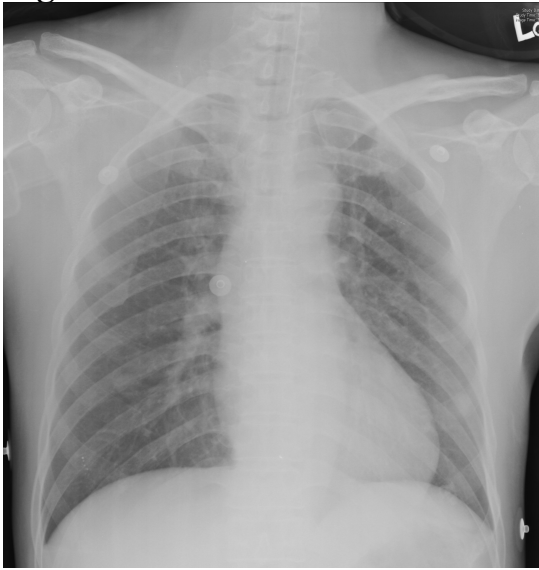


Fig. 2. Panel A. Pre-OP MRI, LMC

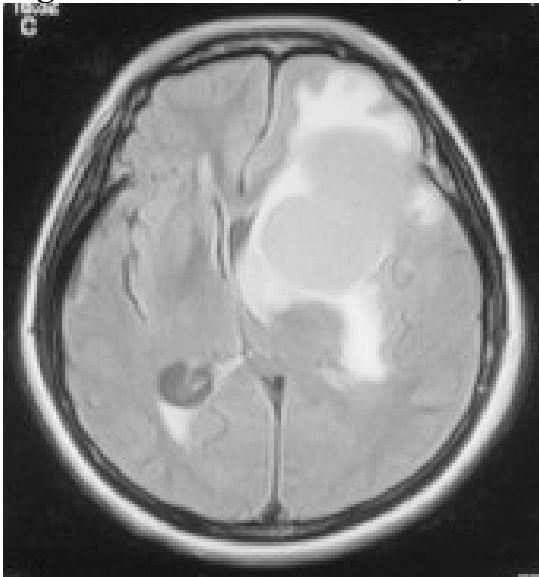
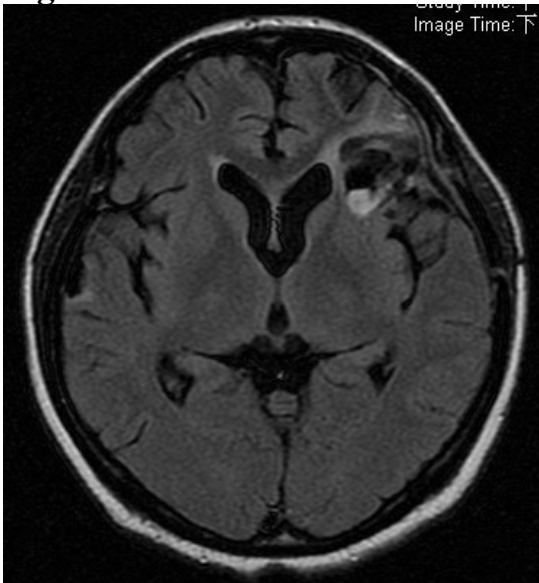


Fig. 2. Panel B. Post-OP MRI



Questions & Discussions:

(Please answer the following questions commented from your RT attending physician.)

Q1: What are your *findings/interpretations* for the above key image(s)?

Q2: What is your *clinical cancer stage*, according to the AJCC 2006, for this case?

Q3: What is your *pathologic cancer stage*, according to the AJCC 2006, for this case?

Q4: What are your *Oncology Diagnosis* and/or other *Assessments* for this case?

Q5: What is your *Oncology Plan* for this case?

Q6: What is your *Radiotherapy Plan* for this case?

(Please reply with the following form: *Indication/Contraindication, Goal, Target & Volume, Technique, and Dose & Fractionation.*)

Q7: How to treat gross residual GBM after craniotomy?

Questions & Discussions: (with potential answers)

(Please answer the following questions commented from your RT attending physician.)

Q1: What are your *findings/interpretations* for the above key image(s)?

A1: As described in the last attached page.

Q2: What is your *clinical cancer stage*, according to the AJCC 2006, for this case?

A2: No TNM clinical stage can be defined for this brain tumor patient in AJCC 2006.

Q3: What is your *pathologic cancer stage*, according to the AJCC 2006, for this case?

A3: No TNM pathology stage can be defined for this brain tumor patient in AJCC 2006. But R2 resection (with gross residual tumor post craniotomy with removal of tumor) can be defined.

Q4: What are your *Oncology Diagnosis and/or other Assessments* for this case?

A4:

1. Oncology Diagnosis: Glioblastoma multiform, WHO Gr. IV, of the brain, left frontal lobe (multiple cystic-like component, tumor size more than 6 cm with significant peri-focal edema and mid-line shift), post craniotomy with removal of brain tumor (2007/11/19) with residual gross tumor (R2 resection)
2. Post-op RT is indicated for this patient.
3. RT treatment goal: potential curative in post-op adjuvant setting.

Q5: What is your *Oncology Plan* for this case?

A5:

1. Suggest Current Oncology Plan:

- (1). Further work-up studies: nil
- (2). Further treatments: post-op RT and considered concurrent and adjuvant Temozolomide (Temodal) use.

Q6: What is your *Radiotherapy Plan* for this case?

(Please reply with the following form: *Indication/Contraindication, Goal, Target & Volume, Technique, and Dose & Fractionation.*)

A6: RT Plan may be designed as the following one:

- (1). **Indication:** post-craniotomy with residual GBM gross tumor
- (2). **Goal:** potentially curative in post-op setting
- (3). **Target & Volume:** Tumor bed (including peri-focal edema region) with adequate margin (2-cm margin); with gross residual tumor boost.
- (4). **Technique:** 3DCRT
- (5). **Dose & Fractionation:** 5940 - 6300 cGy in 33-35 fractions to the tumor bed; 6600 – 7020 cGy to the gross residual tumor.

Q7: How to treat gross residual GBM after craniotomy?

A7:

1. Consider salvage re-craniotomy for potentially total resection;
2. Post-craniotomy RT with concurrent Temodal and adjuvant Temodal after RT according to clinical data from level-I randomized trials.

Further Readings & References: NCCN 2008 & AJCC 2006

Radiation Oncologist
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Key Image(s): (with marked)

Fig. 1. CXR

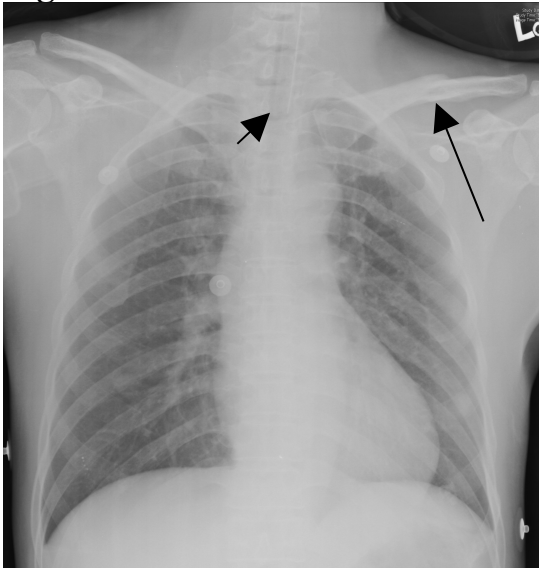


Fig. 1. CXR: increase lung markings; an intra-tracheal tube in place (as the short black arrow); an old fracture over the middle portion of the left clavicle (as the long black arrow).

Fig. 2. Pre-OP MRI, LMC

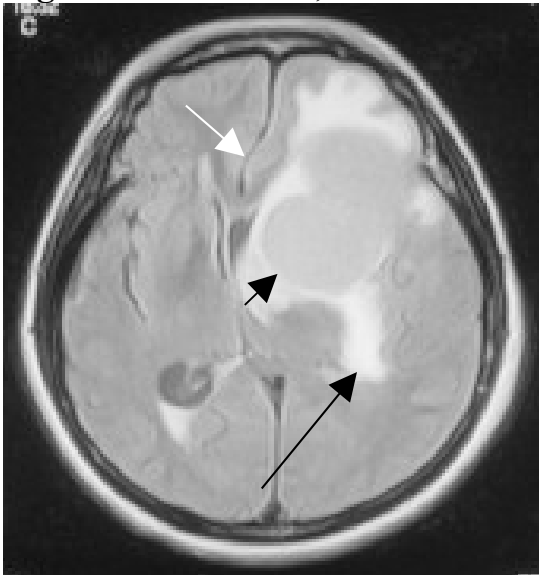


Fig. 2. Pre-cranial brain MRI, T2 sequence with water flare:

1. Confluent brain tumors over the left frontal lobe (as the short black arrow).
2. Significant peri-focal edema (as the long black arrow).
3. Associated midline shift from left to the right (as the white arrow).

Fig. 3. Post-OP MRI

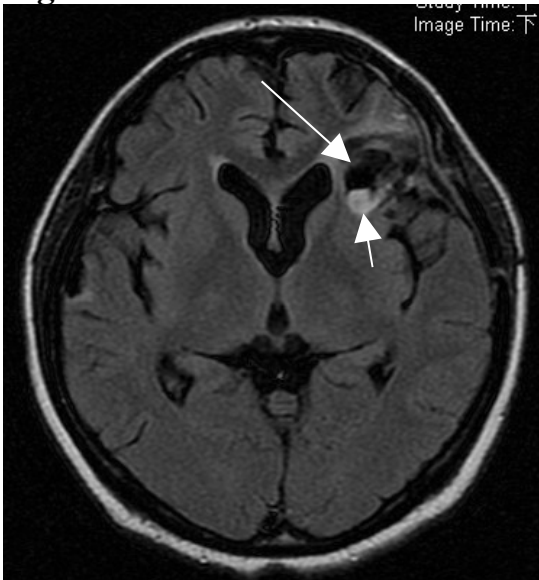


Fig. 3. Post-craniotomy brain MRI, T1 with Ga-contrast:

1. Post-craniotomy with removal of brain tumor with an area of brain tissue loss (as the long white arrow).
2. A nodal lesion with size less than 1 cm with increasing contrast uptake, suspect residual GBM lesions (R2 resection, as the short white arrow).