**Author’s response to reviews**

**Title:** Oncological and functional results after surgical treatment of bone metastases at the proximal femur

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**Author’s response to reviews:**

COVER LETTER

Dear Editors

I would like to thanks Editors and Reviewers for valuable comments which improved the quality of my article. All comments were considered and highlighted in the manuscript.

BSUR-D-17-00303R1

Oncological and functional results after surgical treatment of bone metastases at the proximal femur

Grzegorz Guzik

BMC Surgery

Dear Dr Guzik,

Your manuscript "Oncological and functional results after surgical treatment of bone metastases at the proximal femur" (BSUR-D-17-00303R1) has been assessed by our reviewers. They have raised a number of points which we believe would improve the manuscript and may allow a revised version to be published in BMC Surgery.

Best wishes,

Yingqi Hua
Reviewer reports:

1. Reviewer 1:

In this study, the author investigated different surgical procedures for the patients with proximal femoral metastasis from cancer and compared the different result before and after the surgery. There are some questions for the author to elaborate:

1. What are the inclusion criteria and exclusion criteria for the patients who were treated with modular endoprosthesis, standard hip endoprosthesis and intramedullary nail or titanium plate?

Qualification for treatment always was multidisciplinary with the participation of oncological team. To determine patients' life expectancy and prognosis Karnofsky, ECOG and SSG scores were used.

The indications for radical metastasis resection and modular endoprosthesis implantation were good patients general condition and prognosis regarding life expectancy. Tumors were not resected in patients with a severe general condition and survival prognosis shorter than 3 months.

When metastatic tumour were localised in the femoral head or neck standard endoprostheses were used. If the tumour spread on intertrochanteric region without cortical bone damage long stem were used.

In patients with poor bone quality or after resections in "femoral isthmus" cemented stems were used, because stable cement less stems implantation in the place where the bone expands is impossible. In 68 cases bipolar cup and in 7 cases cemented cup was used. Bipolar cups were used if no degenerative joint disease were observed. In cases with hip osteoarthritis or with metastases in the acetabulum cemented cups were used.
Bone fixations was performed in cases with poor general condition and life expectancy less than 3 months. Type of bone fixation depend on fracture location and shape, extent of bone defect and surgeon preferences.

Added Refferences:

2. Among these patients enrolled in this study, How many metastatic lesions in the skeletal system in one patient? Are there some difference in the procedures selected for patients with solitary metastatic lesion and multiple metastatic lesions?
Single metastases were diagnosed in 36 patients mainly with breast cancer - 18, kidney cancer - 8, myeloma -7 and thyroid cancer - 3 patients. In 86 cases multiple bone metastases were diagnosed and located mainly in the spine and pelvis. The number of metastases, as a single factor, did not decide on the method of surgical treatment.

3. Before the treatment, does the author have some evaluation system for the expected life span of the patients? Does the evaluation of the expected life span influence the application of the different treatment procedure?
Qualification for treatment always was multidisciplinary with the participation of oncological team. To determine patients' life expectancy and prognosis Karnofsky, ECOG and SSG scores were used.

4. Line 160 to line 162, "In 94 cases 3-4 weeks after surgery patients undergo external beam radiotherapy (8Gy). We performed radiotherapy in 77 patients after modular endoprosthetic replacement, 4 patients after standard endoprosthetic replacement and 13 patients after bone fixation."
What are the indications for the treatment of radiotherapy after surgery? When the patients were treated with wide resection and modular endoprosthetic replacement or standard endoprosthetic
replacement, do they need the radiotherapy in the surgical location? Or, the other locations with metastasis in the skeletal system need this treatment?

There are many methods of bone metastases radiotherapy. In patients who was previously radiated and in cases of uncomplicated bone metastases 8Gy in single dose should be usually used. In cases with pathological farcture and treated only with radiotherapy 30-40 Gy in 10 fractions can be used [15-18].

92 patients undergo external beam radiotherapy in 3-4 weeks after surgery according to the EMSOS recommendation. The decision about necessity of radiotherapy application was made by the oncological consilium. It was not used when radiation dose was exceeded prior to surgery or in cases with contraindications for radiotherapy. In our series 8 Gy in single dose was usually used. 30-40 Gy in 10 fractions was not used because of the risk of skin necrosis and infectious complications. Higher doses of radiation were used in patients treated only with radiotherapy.

Added References:

5. Line 169-170, "We noticed 9 cases of local recurrences, 6 in patients who had no radiotherapy. Three patients after modular endoprosthesis replacement and 6 after bone fixations."

What is the definition of recurrence? After wide resection of the metastasis and modular endoprosthesis replacement, the new appearance of metastasis in the surgical field can be called
recurrence. However, for the intrallesional curettage and fixation, is it called recurrence or progression?

Local recurrence was observed in 3 patients after modular endoprosthetic replacement and metastatic tumour progression in 6 patients after bone fixations.

Added References:


2. Reviewer 2:

This article shows that the results of surgical treatment for the proximal femur are good in patients after standard or endoprosthesis replacement. The conclusions were accepted by orthopedic oncological surgeons now, but some questions should be answered.

1. In this paper, the authors used tumor resection method to treat 101 patients and in 21 patients metastatic tumors was not resected, so what is the indication of metastatic tumor resection and the cause of unresected?

Qualification for treatment always was multidisciplinary with the participation of oncological team. To determine patients’ life expectancy and prognosis, Karnofsky, ECOG and SSG scores were used.

The indications for radical metastasis resection and modular endoprostheses implantation were good patients general condition and prognosis regarding life expectancy. Tumors were not resected in patients with a severe general condition and survival prognosis shorter than 3 months.

When metastatic tumor were localised in the femoral head or neck, standard endoprostheses were used. If the tumour spread on intertrochanteric region without cortical bone damage, long stem were used.

In patients with poor bone quality or after resections in "femoral isthmus" cemented stems were used, because stable cement less stems implantation in the place where the bone
expands is impossible. In 68 cases bipolar cup and in 7 cases cemented cup was used. Bipolar cups were used if no degenerative joint disease were observed. In cases with hip osteoarthritis or with metastases in the acetabulum cemented cups were used.

Bone fixations was performed in cases with poor general condition and life expectancy less than 3 months. Type of bone fixation depend on fracture location and shape, extent of bone defect and surgeon preferences.

2. As we know, the patients with proximal femur metastatic tumor underwent tumor resection and replacement with cemented proximal femur modular prosthesis (semi-hip replacement) and not total hip. From this paper, we can not know which prosthesis the authors used and what is the indication of the cemented or cementless prosthesis?

In 75 patients wide tumour resection and modular endoprosthetic replacement were prefomed. Cemented proximal femur modular stem was used in 22 cases (GMRS-Stryker) and cementless in 53 cases (MUTARS-Implant Cast). In patients with poor bone quality or after resections in "femoral isthmus" cemented stems were used, because stable cement less stems implantation in the place where the bone expands is impossible. In 68 cases bipolar cup and in 7 cases cemented cup was used. Bipolar cups were used if no degenerative joint disease were observed. In cases with hip osteoarthritis or with metastases in the acetabulum cemented cups were used.

14 patients underwent intralesional tumour resection and standard hip endoprosthetic replacement, and 7 patients long stem endoprosthetic replacement (Stryker). When metastatic tumour were localised in the femoral head or neck standard endoprostheses were used. If the tumour spread on intertrochanteric region without cortical bone damage long stem were used. In our series only cemented standard endoprostheses were used.

3. The authors should show us related radiographs of patients, including preoperative, postoperative, good follow-up result, postoperative revision, intramedullary nail broke and prosthesis loosen.

Figures was added in manuscript as Reviewer suggested.

4. Radiotherapy is very important procedure to reduce postoperative recurrence, many reports documented that the effective dose should be over 40Gy. Why did the authors give their patients 8 Gy?
There are many methods of bone metastases radiotherapy. In patients who was previously radiated and in cases of uncomplicated bone metastases 8Gy in single dose should be usually used. In cases with pathological fracture and treated only with radiotherapy 30-40 Gy in 10 fractions can be used [15-18].

92 patients undergo external beam radiotherapy in 3-4 weeks after surgery according to the EMSOS recommendation. The decision about necessity of radiotherapy application was made by the oncological consilium. It was not used when radiation dose was exceeded prior to surgery or in cases with contraindications for radiotherapy. In our series 8 Gy in single dose was usually used. 30-40 Gy in 10 fractions was not used because of the risk of skin necrosis and infectious complications. Higher doses of radiation were used in patients treated only with radiotherapy.

Added References:

Please positive review my article.

Yours faithfully Grzegorz Guzik

I’m waiting Your answer.