Evaluation of the diagnostic accuracy of open versus closed image-guided biopsies in musculoskeletal lesions. A retrospective review of 1149 biopsies performed on 1048 patients.

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Introduction and Objectives
Biopsy is considered as a milestone in the diagnosis and treatment of musculoskeletal lesions. For most such tumours, appropriate treatment cannot be initiated until definite tissue diagnosis is available. Closed core-needle biopsy under Computed Tomography or ultrasound guidance seem to be the gold standard, since it is much easier to perform than the open, is well-tolerated, secures proper needle position, is accompanied by less morbidity and tumor cells spillage and costs less. Open biopsy on the other hand provides the pathologist with more tissue and may lead to more secure diagnosis. Aim of this case-series study was the review of all biopsies (closed and open) performed at our department in patients suffering from soft-tissue and bone tumours and the evaluation of the diagnostic accuracy of the closed procedure.

Methods
We retrospectively reviewed the case notes of patients with musculoskeletal lesions who underwent closed or open biopsies during the last 12 years. The necessity for an additional open biopsy following a closed one, the validation of the closed biopsy’s result with that of the definite pathology report following the excision of a lesion and the complication and morbidity rates accompanying closed and open biopsies were registered and analyzed.

Results
Between December 2003 and October 2015, a total of 1149 biopsies were performed on 1048 patients (572 female and 476 male) suffering from 261 benign and 771 malignant (357 primary and 414 metastatic) musculoskeletal lesions. Sixteen patients were suffering from Giant Cell Tumour. In all 1048 patients a closed biopsy under image guidance was initially performed. In 789 cases CT-scan guidance was used; the remaining 259 were performed under US guidance. In 101 cases (9.6%) an open biopsy was deemed as necessary in order to reach a secure diagnosis, due to the insufficient quantity of tissue obtained during the closed biopsy. In 845 patients, the tumour was operatively excised or underwent curettage. The final pathology report of the excised specimen was in accordance with the initial report which was based on the biopsy tissue in 808 cases; in the remaining 37 cases (4.4%) there was a discrepancy between the two reports. In 33 out of these cases a closed biopsy had been performed. There were two cases of post-biopsy haematomas and none of infections in patients who had undergone closed biopsies. One case of a painful neuroma was developed following a closed biopsy of a benign tumour, which eventually necessitated its operative excision. Eleven cases of mild postoperative hematomas also developed. In another case an extraosseous migration of a primary aneurysmal bone cyst following CT-guided core needle biopsy was developed, which also required surgical intervention (marginal excision).

Discussion/Conclusion
Closed image-guided core needle biopsy seems to be the gold standard method to accurately and efficiently obtain tissue for pathologic examination for both benign and malignant lesions (both primary and metastatic). When performed by experienced radiologists, this method is accompanied by very high success rates, less morbidity than the open biopsy and very high rates of diagnostic accuracy.

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Keywords : open biopsy, closed image-guided biopsy, bone, soft-tissue

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