

# DEPARTMENT OF THE AIR FORCE 59TH MEDICAL WING (AETC) JOINT BASE SAN ANTONIO - LACKLAND TEXAS



31 JULY 2017

MEMORANDUM FOR SGVT

ATTN: CAPT SIERRA MUSICK

FROM: 59 MDW/SGVU

SUBJECT: Professional Presentation Approval

Your paper, entitled <u>Chondroblastic Osteosarcoma Presenting as a Pulmonary Embolism</u> presented at/published to <u>Archives of Pathology</u>, <u>College of American Pathologists CAP17</u> <u>The Pathologists' Meeting</u>, <u>Gaylord National</u>, <u>Maryland</u>, <u>October 8-11 2017</u> in accordance with MDWI 41-108, has been approved and assigned local file #<u>17298</u>.

Pertinent biographic information (name of author(s) title, etc.) has been entered into our computer file. Please advise us (by phone or mail) that your presentation was given. At that time, we will need the date (month, day and year) along with the location of your presentation. It is important to update this information so that we can provide quality support for you, your department, and the Medical Center commander. This information is used to document the scholarly activities of our professional staff and students, which is an essential component of Wilford Hall Ambulatory Surgical Center (WHASC) internship and residency programs.

Please know that if you are a Graduate Health Sciences Education student and your department has told you they cannot fund your publication, the 59th Clinical Research Division may pay for your basic journal publishing charges (to include costs for tables and black and white photos). We cannot pay for reprints. If you are a 59 MDW staff member, we can forward your request for funds to the designated Wing POC at the Chief Scientist's Office, Ms. Alice Houy, office phone: 210-292-8029; email address: alice.houy.civ@mail.mil.

Congratulations, and thank you for your efforts and time. Your contributions are vital to the medical mission. We look forward to assisting you in your future publication/presentation efforts.

LINDA STEEL-GOODWIN, Col, USAF, BSC Director, Clinical Investigations & Research Support

Linda Steel-Goodwin

## PROCESSING OF PROFESSIONAL MEDICAL RESEARCH/TECHNICAL PUBLICATIONS/PRESENTATIONS

## INSTRUCTIONS

# USE ONLY THE MOST CURRENT 59 MDW FORM 3039 LOCATED ON AF E-PUBLISHING

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- 11. The Joint Ethics Regulation (JER) DoD 5500.07-R, Standards of Conduct, provides standards of ethical conduct for all DoD personnel and their interactions with other non-DoD entities, organizations, societies, conferences, etc. Part of the Form 3039 review and approval process includes a legal ethics review to address any potential conflicts related to DoD personnel participating in non-DoD sponsored conferences, professional meetings, publication/presentation disclosures to domestic and foreign audiences, DoD personnel accepting non-DoD contributions, awards, honoraria, gifts, etc. The specific circumstances for your presentation will determine whether a legal review is necessary. If you (as the author) or your supervisor check "NO" in block 17 of the Form 3039, your research or technical documents will not be forwarded to the 502 ISG/JAC legal office for an ethics review. To assist you in making this decision about whether to request a legal review, the following examples are provided as a guideline:

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If the sponsor of a conference or meeting is a DoD entity, an ethics review of your presentation is not required, since the DoD entity is responsible to obtain all approvals for the event.

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- NOTE: All abstracts, papers, posters, etc., should contain the following disclaimer statement:
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# Chondroblastic Osteosarcoma Presenting as a Pulmonary Embolism

Authors: Sierra Musick, MD, David T Lynch, MD, Gabriella Cardoza-Favarato, MD



# Introduction

Osteosarcomas are more common in younger adults; however, extraskeletal osteosarcomas are more likely in older adults. Extraskeletal osteosarcoma is defined as a malignant mesenchymal neoplasm that produces varying amounts of osteoid, immature bone or chondroid matrix, located in the soft tissue without connection to the skeleton. The retroperitoneum, deep muscles of the thigh, pelvis and shoulder girdles are common locations. These tumors tend to be highly aggressive with only a 20% average 5-year survival rate.

These lesions are thought to represent the progression of soft tissue or epithelial malignancies. Rarely, extraskeletal osteosarcomas have been known to occur in the heart and the pulmonary arteries, the latter of which can present as a pulmonary embolism. They are highly aggressive and commonly metastasize to the lungs. We report a case of a woman found to have chondroblastic osteosarcoma in her heart and pulmonary arteries.

# **Case Report**

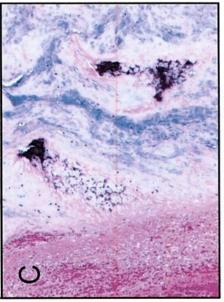
A previously healthy 63-year-old woman presented with several weeks of shortness of breath and fatigue was diagnosed with a massive pulmonary embolism. On imaging, she was diagnosed with occlusion of the right segmental pulmonary arteries and multifocal pulmonary infarcts of the right lung. A biopsy of the suspected pulmonary embolism showed minute fragments of thrombus with admixed inflammatory cells, but was negative for malignancy. The clinical team's suspicion for malignancy persisted given the lack of response to anticoagulation and thrombolysis. However, a full body positron emission tomography (PET) scan did not reveal any malignant foci.

Upon pulmonary artery embolectomy, a mass was identified. The pulmonary artery mass frozen specimen was a white-tan-red glistening multinodular firm mass with a cut surface revealing solid and cystic areas with a gelatinous appearance. Histologically, it was reported as an atypical osteocartilaginous neoplasm, which prompted a unilateral pneumonectomy. Grossly, the pneumonectomy specimen demonstrated the mass occluding multiple large and small pulmonary vessels (Figure A).

On permanent sections, a neoplasm in the pulmonary artery and lung showed lobules of neoplastic cartilage with surrounding and intervening spindle cells, osteoid and bone (Figure B and C). The mitotic rate was greater than 20/10 HPFs and the histological grade was 3. Direct chest wall extension and lympho-vascular invasion were also identified. Necrotic chondroid tissue was found in the tricuspid valve vegetation. Undifferentiated malignant spindle cells were found in the pulmonic valve vegetation. Further imaging and physical exam revealed no other site of tumor.







# Pathology

Figure A. Gross examination of pneumonectomy specimen with large pulmonary vessel containing the mass (red arrow).

Figure B. Hematoxylin and eosin histopathologic evaluation demonstrating the neoplasm in the pulmonary artery.

Figure C. Hematoxylin and eosin histopathologic evaluation showsing neoplastic spindle cells, osteoid and bone next to an area of hemorrhage and necrosis.

# Discussion

Alternatively, this tumor could have been a metastasis. However, this is Extraskeletal osteosarcoma comprise only 1% to 2% of all soft tissue sarcomas (3). They typically occur in patients older than 40 years of age with no clear sex predilection. Common locations include the lower extremity, particularly the thigh, the upper extremities and the retroperitoneum. Rarely, extraskeletal osteosarcomas have been known to occur in the heart, pulmonary pleura, pulmonary arteries, mediastinum, mesentery, omentum and esophagus. Those arising in Production of osteoid or bone by cytological malignant cells is required for diagnosis (2). Histologically, extraskeletal osteosarcomas resemble undifferentiated pleomorphic sarcomas with the addition of osteoid. Atypical cartilage, if present, rarely predominates, as was the case in this patient's tumor. Given the hypothesis that these lesions represent the progression of soft tissue or epithelial malignancies, it is most unlikely given the full body positron emission tomography (PET) scan likely that this patient's tumor arose from the pulmonary arteries and subsequently spread to the cardiac valves in the form of vegetations. the lung are especially rare, with the first case report in 1933 (1).

# Defendance of

with intravascular and parenchymal metastatic chrondorblastic

osteosarcoma with the suspected site of origin being the lung

vasculature. This case highlights an uncommon presentation

diagnostically challenging case of chondroblastic osteosarcoma.

did not reveal any malignant foci. The differential diagnosis should include other malignant tumors that may have metaplastic bone formation, such as epithelioid sarcoma, synovial sarcoma, mixed malignant mullerian tumor (MMMT) and malignant melanoma. The patient had no history of malignancy and therefore was diagnosed

- 1. Wagner MS, Reyes CV. Primary chondroblastic osteosarcoma of the lung. Sarcoma. 1999;3(3/4):193-19:
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  6. Kasagi Y, Vamazaki K, Cikadome K, et al. Chondroblastic osteosarcoma arising from the pleura: report of a case. Surgery Today (serial online). 2009;39[12]:1064-1067. Available from: MEDLINE Complete, ipswich, MA. Acces July 27, 2017.

Osteosarcomas are more common in younger adults; however, extraskeletal osteosarcomas are more likely in older adults. Rarely, osteosarcomas have been known to occur in the heart and the pulmonary arteries, the latter of which can present as a pulmonary embolism. They are highly aggressive and commonly metastasize to the lungs. We report a case of a woman found to have chondroblastic osteosarcoma in her heart and pulmonary arteries. A previously healthy 63-year-old woman presented with several weeks of shortness of breath and fatigue was diagnosed with a massive pulmonary embolism. On imaging, she was diagnosed with occlusion of the right segmental pulmonary arteries and multifocal pulmonary infarcts of the right lung. A biopsy of the suspected pulmonary embolism showed minute fragments of thrombus with admixed inflammatory cells, but was negative for malignancy. Upon pulmonary artery embolectomy, a mass was identified. The pulmonary artery mass frozen specimen was a white-tan-red glistening multinodular firm mass with a cut surface revealing solid and cystic areas with a gelatinous appearance. On permanent sections, a neoplasm in the pulmonary artery and lung showed lobules of neoplastic cartilage with surrounding and intervening spindle cells and osteoid (see image). Necrotic chondroid tissue was found in the tricuspid valve vegetation. Undifferentiated malignant spindle cells were found in the pulmonic valve vegetation. Imaging and physical exam revealed no other site of tumor. This case highlights an uncommon presentation of a diagnostically challenging case of chondroblastic osteosarcoma.

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