Evidence to support the hypothesis of tuberculosis as a cause of extreme osteonecrosis and osteomyelitis of the mandible in a West African population

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BACKGROUND
We have previously reported 60 cases of extreme osteonecrosis and osteomyelitis of the maxillofacial skeleton (1). Maxillofacial tuberculosis is rare. Nineteen cases collected over a three month period in West Africa, showing extreme bony destruction in the mandible are presented. A potential link between tuberculosis and destruction of the jaw bones is suggested by three recent case reports describing a tuberculous lesion in the condylar head of the mandible (2,3,4) Hebling CA 2010, Patel M et al, 2012, Ranganathan LK et al 2012).

PATIENTS AND METHODS
Samples from 19 patients, Sierra Leone (n=17) and Liberia (n=2), collected over a three month period from outpatients who voluntarily attended the dental clinic. High resolution 3D micro CT scanning (Xradia MicroXCT-200) was used to evaluate bony destruction in the condylar head. Paraffin embedded sections were stained with H&E and immunohistochemistry. Samples were stained with antibodies against EMR-1 (Thermo Fisher Scientific PAS-33502), a marker for mature macrophages. Immunohistochemical staining with antibodies against purified proteins derived from M.tuberculosis (GenWayBio GWB.EF714E) were used to demonstrate mycobacterial proteins in and around macrophages.

CONCLUSION
Many of the patients in the current study show an almost identical clinical presentation to the case reports documenting TB lesions of the condylar head ( 2,3,4). We demonstrated antigenic material derived from M.tuberculosis in macrophages and soft tissue. These activated EMR-1-positive macrophages, in conjunction with osteoclasts, may be responsible for the pattern of bony destruction observed by micro CT imaging of the condylar head. Several factors suggest that there may be an association between tuberculosis infection and the pattern of maxillofacial destruction seen in many of the patients in this presented study. Studies are underway to DNA sequence the mycobacterial material collected. A further clinical documentation, TB testing and sample collection trial is planned to start in late 2016.