

# Prognostic implication of immunohistochemical Runx2 expression in osteosarcoma

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## ABSTRACT

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**Aims and background.** Osteosarcoma is the most common primary bone malignancy. Many genetic markers have proven prognostic value in osteosarcoma and studies are under way to determine their potential application as specific therapeutic targets. Runx2, Indian hedgehog (IHH), and Sox9 are proteins that play major roles in bone formation and tumorigenesis. We studied the protein expression of Runx2, IHH, and Sox9 in osteosarcoma and correlated their expression with clinicopathological variables. We also studied the prognostic value of the expression of these three genes in osteosarcoma.

**Methods and study design.** We produced 48 formalin-fixed, paraffin-embedded tissue microarrays containing osteosarcoma tissue cores for immunohistochemical staining of Runx2, IHH and Sox9. We evaluated the expression of each gene by immunohistochemical staining and analyzed the relationship between expression and clinicopathological parameters.

**Results.** High expression of Runx2 was significantly related to metastasis ( $P = 0.015$ ). High expression of Runx2 indicated a trend toward a poor survival rate ( $P = 0.056$ ). High expression of IHH and Sox9 were not related to any clinicopathological parameters.

**Conclusions.** High expression of Runx2 was significantly related to tumor metastasis in osteosarcoma. Our results suggest that overexpression of Runx2 might be a useful prognostic marker in osteosarcoma cases.

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**Key words:** Osteosarcoma, Runx2, IHH, Sox9.

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