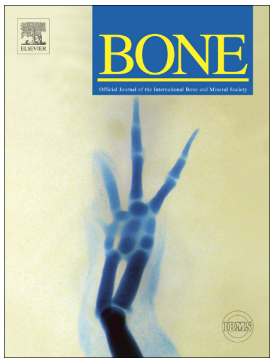

Vascular ossification: Pathology, mechanisms, and clinical implications

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Vascular Ossification: pathology, mechanisms, and clinical implications

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Abstract:

In recent years, the mechanisms and clinical significance of vascular calcification have been increasingly investigated. For over a century, however, pathologists have recognized that vascular calcification is a form of heterotopic ossification. In this review, we aim to describe the pathology and molecular processes of vascular ossification, to characterize its clinical significance and treatment options, and to elucidate areas that require further investigation. The molecular mechanisms of vascular ossification involve the activation of regulators including bone morphogenic proteins and chondrogenic transcription factors and the loss of mineraliztion inhibitors like fetuin-A and pyrophosphate. Although few studies have examined the gross pathology of vascular ossification, the presence of these molecular regulators and evidence of microfractures and cartilage have been demonstrated on heart valves and atherosclerotic plaques. These changes are often triggered by common inflammatory and metabolic disorders like diabetes, hyperlipidemia, and chronic kidney disease. The increasing prevalence of these diseases warrants further research into the clinical significance of vascular ossification and future treatment options.

Keywords: vascular ossification, heterotopic ossification, vascular calcification, review.