# Oyster calcification

An extremely rare case of chronic epidural empyema after cranioplasty is presented. It derives its extreme rareness from its association with calcification. This patient when presented to the department had a complaint of swelling with on and off discharging sinus for 2 months adjacent to the old incision scar mark. The patient had a history of decompressive craniectomy and evacuation of acute subdural hematoma, in some other institution, 8 years back. Following that, the patient underwent cranioplasty with the exteriorized and preserved bone flap. In the meantime, he was asymptomatic. It is a unique interesting case of chronic epidural empyema with calcified walls after 8 years of long duration following cranioplasty [1].

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Oyster calcification refers to the process by which oysters form and deposit calcium carbonate, primarily in the form of aragonite, to create their shells. Oysters, like other mollusks, have a protective outer shell that serves as a structural support and defense mechanism against predators and environmental factors.

The shell formation in oysters involves a complex biological process known as biomineralization. Here is a general overview of how oyster calcification occurs:

Mantle Tissue: The mantle is a specialized tissue in oysters responsible for shell formation. It secretes proteins and other organic molecules that play a crucial role in the mineralization process.

Ions Uptake: The mantle extracts calcium ions (Ca2+) and carbonate ions (CO3^2-) from the surrounding environment, often in seawater, where these ions are abundant.

Biomineralization: Within the mantle tissue, the calcium and carbonate ions combine to form calcium carbonate (CaCO3), specifically in the aragonite crystal form. This process is controlled by enzymes and proteins secreted by the mantle.

Shell Formation: The newly formed aragonite crystals are deposited on the inner surface of the oyster's shell, gradually building and extending the shell's structure.

Layered Structure: The shell is composed of distinct layers, including the innermost nacreous layer (mother-of-pearl) and outer prismatic layer, which together provide strength and protection.

The calcification process is dynamic and can be influenced by various environmental factors, including water temperature, pH, and the availability of calcium and carbonate ions. Oysters regulate these factors to optimize shell growth and maintenance.

Understanding oyster calcification is not only important in the context of shell formation but also has broader implications for marine ecology and environmental studies. Changes in ocean chemistry, such as ocean acidification, can impact the ability of marine organisms, including oysters, to form and maintain their shells, with potential ecological consequences.

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Verma PK, Gandhi A, Kumar P, Jain SK. Oyster Calcification of Infected Bone Flap: A Rare Complication. Asian J Neurosurg. 2018 Jul-Sep;13(3):797-799. doi: 10.4103/ajns.AJNS_237_16. PMID: 30283550; PMCID: PMC6159056.