

Raft Formation of Sodium Alginate in the Stomach

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Sodium alginate is used to relieve symptoms of gastroesophageal reflux disease.¹ When combined with acid, sodium alginate precipitates and forms a gel form. Bicarbonate-containing alginate formulations such as Gaviscon (Reckitt Benckiser Healthcare, Hull,

UK) release carbon dioxide as a reaction to gastric acid, and the carbon dioxide is entrapped in the gel precipitate, forming a “raft.”² On the other hand, an alginate formulation without gas generation forms a “raft” in the stomach, if the dosage form has a lower density

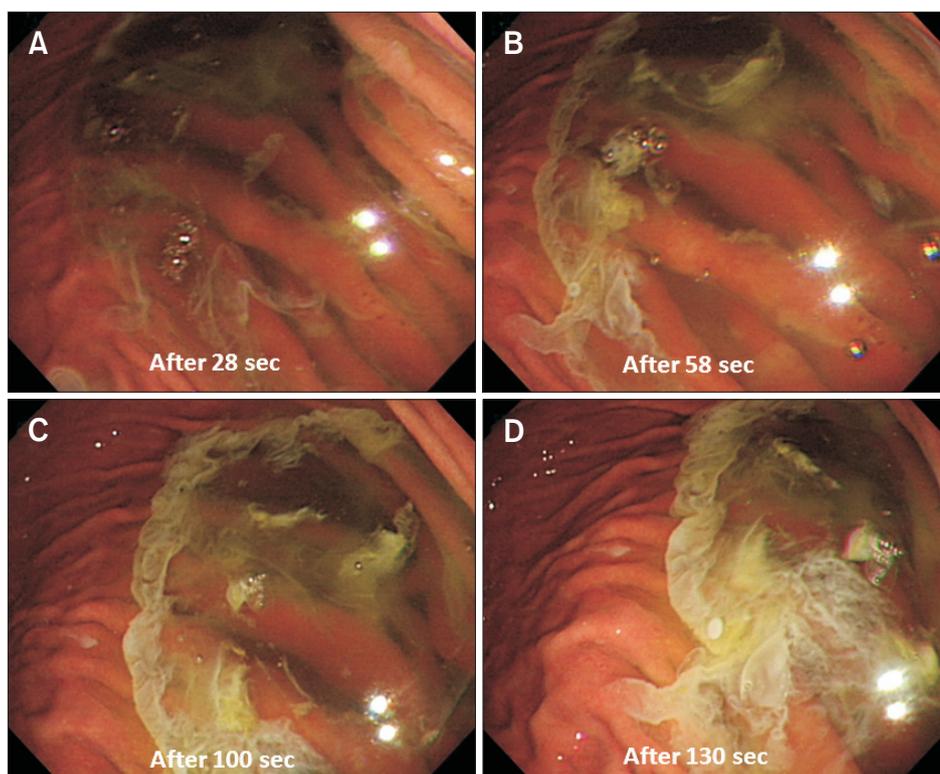


Figure. Raft formation of sodium alginate. (A) After 28 seconds of infusion, a precipitate developed. (B and C) A thin membrane-like material formed at the boundary. (D) The membrane floated on the gastric fluid.

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than that of gastric fluid, which is 1.004 g/cm^3 .³ Herein, pictures of the raft formation observed on esophagogastroduodenoscopy (EGD) are shown.

A 35-year-old woman underwent EGD for chronic dyspepsia. During EGD, a biopsy was performed for a small erosion. Then, to prevent hemorrhage from the biopsy site, alginate (Lamina G, Taejoon Pharm, Korea) was infused into the stomach under EGD. Soon after the infusion of sodium alginate, a precipitate developed on the surface of the gastric fluid (Figure A). Then, a thin membrane-like material formed at the boundary of the gastric fluid (Figure B and C), and the size of the membrane grew, forming a “raft” (Figure D) (Supplementary Video).

Floating drug delivery systems are classified into non-effervescent and effervescent systems.³ The non-effervescent system includes matrix-forming polymers such as sodium alginate.⁴ The effervescent system includes gas-generating systems such as Gaviscon and volatile liquid-containing systems.³ In this case, the floating phenomenon of alginate precipitate might have resulted from the low density of the non-effervescent system used. Although the alginate “raft” would have sunk after several minutes, it may explain part of the symptom relief experienced shortly after ingestion of sodium alginate only.

Supplementary Material

Note: To access the supplementary video mentioned in this article, visit the online version of *Journal of Neurogastroenterology and Motility* at <http://www.jnmjournal.org/>, and at <http://dx.doi.org/10.5056/jnm16068>.

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