

S.PARK, D.HONG. **Self-growing motion mechanism for inspection and maintenance.** *Gerontechnology 2012;11(2):93*; doi:10.4017/gt.2012.11.02.420.00 **Purpose** An inspection and maintenance system is essential to obtain a proper and stable construction. However, internal inspection and maintenance of the inner parts of pipeline¹⁻² are difficult to conduct. Force effects should be eliminated to accurately inspect the state of a pipeline. This paper suggests a self-growing mechanism (SGM) which focuses on a minimization of force effects compared to previous progress maintenance methods. **Method** SGM mimicks the motion of amoeba, a protozoan, as a growing unit. It is shaped like a reversed hose (*Figure 1*). The SGM represents gelation and isolation of the amoeba³⁻⁴; the inside skin is fixed outside and fluid is injected. In this way contact force is minimized so as to be negligible. By passing through injected fluid, the SGM acts as a buffer. Nevertheless, there is a limit to the use of this instrument for maintenance due to the drift of the upper section of the growing unit. To overcome this and expand the field application, the SGM was equipped with auxiliary equipment called install-base, this is composed of three rings. Bundling several units was also considered. This can give SGM direction by differential fluid injection to each unit, and facilitates progress through the curved paths. **Results & Discussion** SGM allows only contact force on the surface, similar to amoeba movement. This can be described as the contact which occurs when a rolled surface unfolds. SGM can help in the maintenance process of highly hazardous or unreachable spots, such as nuclear power plants, pipelines, and so on. It is best suited for highly sensitive environments. SGM is also promising in combination with inspection and maintenance of constructions with field endoscopy; it can provide medical checkups or remedies innovatively. Moreover, it is expected that SGM, unlike previous methods, can more accurately carry out maintenance of gradually downsized applications.

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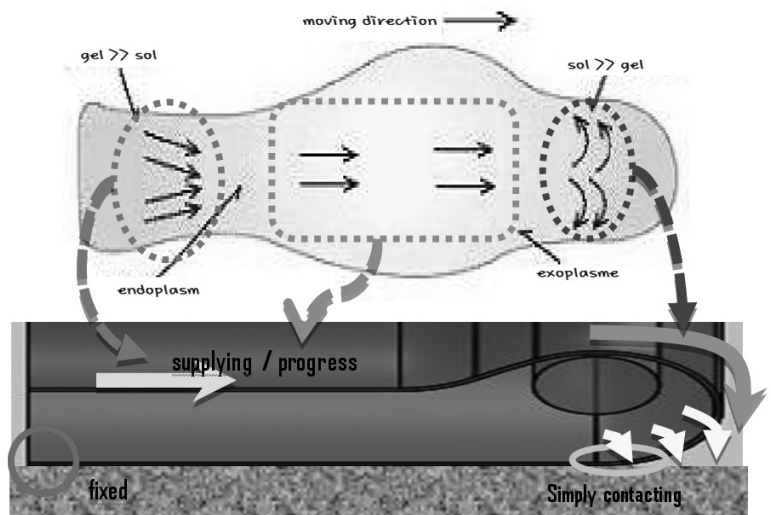


Figure 1. Concept of the self-growing unit with respect to a protozoan mimetic