Peristaltic Flow in a Deformable Channel

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The effects of wall contraction or expansion on the characteristics of the peristaltic flow have been considered in this paper. For that, we present a theoretical model of laminar incompressible viscous peristaltic flow in a deformable channel. The problem is modeled in terms of unsteady twodimensional Navier Stokes equations and the solution is obtained using the perturbation method. The physical parameters appearing due to deformation and the peristaltic motion are the wall expansion ratio (α) and the wave number (δ), respectively. Analytic perturbation results are obtained for small wave number and small wall expansion ratio. Basically the study is undertaken to examine the peristaltic motion along with the deformation of the channel. This will enhance our understanding of deformation/squeezing and peristalsis phenomena independently and jointly. Deformation effects are shown on the otherwise peristaltic fluid flow. The results of peristaltic flow [Shapiro et al., J. Fluid Mech. Digit. Archive **37**, 799 (1969)] can be recovered for the limiting case of α equal to zero.

Key words: Deformable Channel; Peristaltic Pumping.