Electronic Supplementary Material (ESI) for Soft Matter.

Supporting online material

1. Fracture of gel by a flat punch

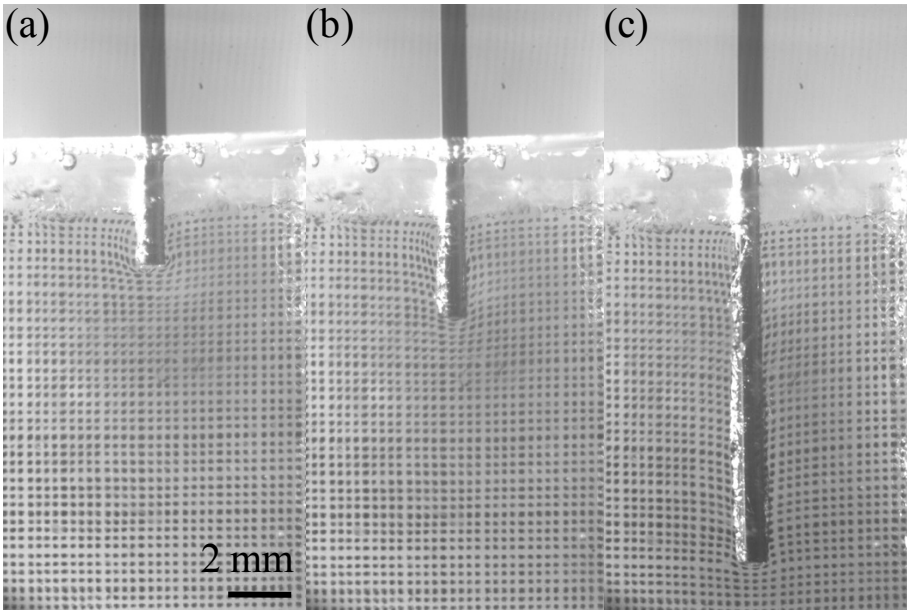

Figure S1. Optical micrographs show sequence of fracture of a gel block of modulus, $\mu = 30$ **kPa with a symmetric object: a rigid flat punch of diameter,** $d = 0.85$ **mm.**

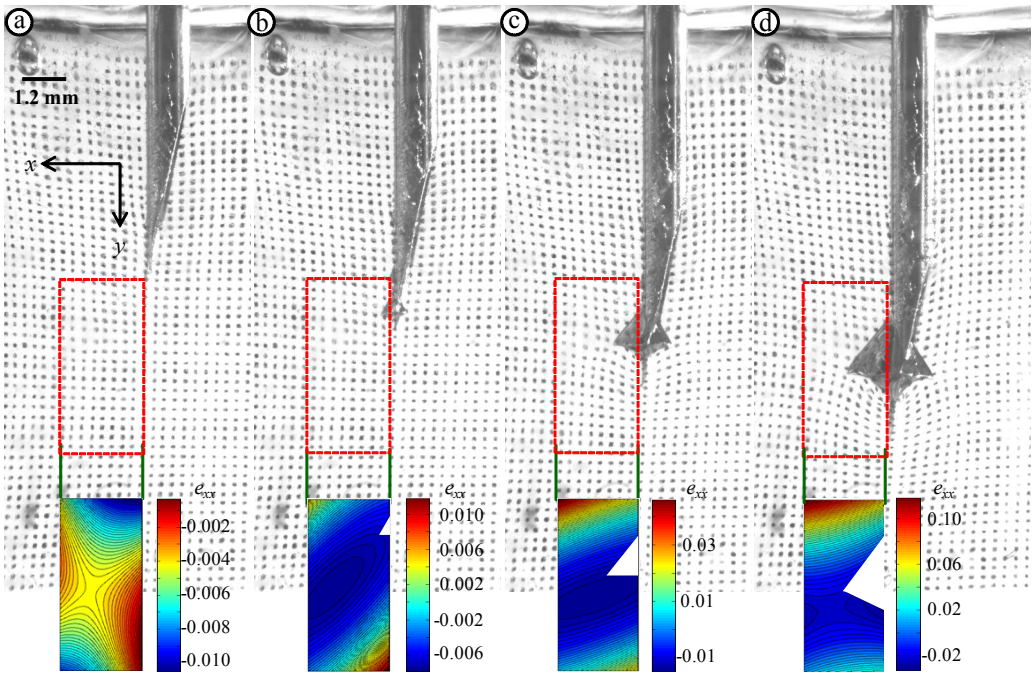

Figure S2. The sequence of contour plots show the spatial variation and evolution of horizontal strain e_{xx} within the dotted area with progress in fracture of the gel block. A single tip needle of diameter $d = 1.2$ mm is driven into a gel block of modulus $\mu = 30$ kPa at a speed of 0.5mm/sec.

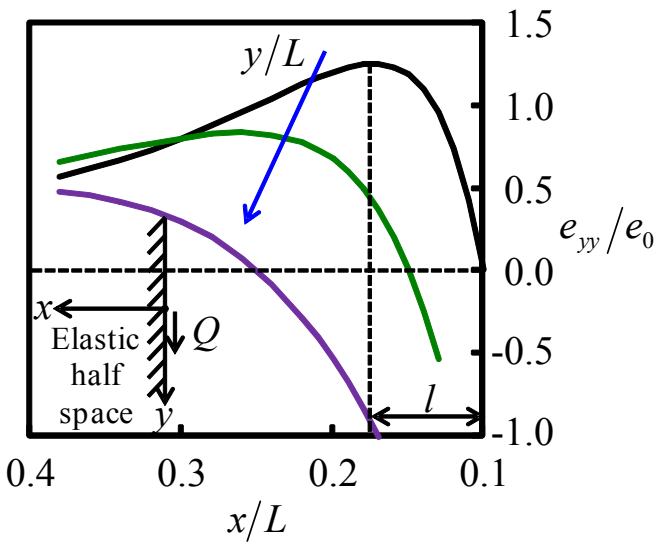

Figure S3. A two dimensional elastic half space is subjected to a shear load Q. The strain field in the elastic medium around the point of application of the load can be estimated by solving the stress equilibrium relations under plane strain approximations. For an incompressible material, the vertical strain e_{yy} can be derived as $e_{yy} = \frac{Q}{2\pi\mu}\frac{y\left(x^2 - y^2\right)}{\left(x^2 + y^2\right)^2}$, and plotted as a dimensionless quantity e_{yy}/e_0 against the dimensionless distance x/L for constant values of y/L. The plots show that e_{yy} varies non-monotonically along x with a maximum value at an intermediate distance l, which varies with the vertical height as $l = 1.732y$. In essence, the distance l does not remain constant with vertical height y but moves further away from the surface of the medium as y is increased.