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Table S1 Nomenclature

Fig. S1 Dependency of tortuosity, $\tau^{(k)}$, constrictivity, $\beta^{(k)}$, and crack network parameter, $T_{ij}$, on dimensionless crack density in each model. (a-1) to (a-3) are under hydrostatic conditions, (b-1) to (b-3) are under conventional triaxial conditions, and (c-1) to (c-3) are under polyaxial conditions. Each dataset represents the average values of 100 instances of crack models, plotted for each direction, with error bars indicating the standard deviation. At $F_0 = 0.97$, there may be no percolating flow path, in which case the value on the vertical axis is 0. Additionally, since constrictivity means the influence of bottlenecks, it equals 1.0 under hydrostatic conditions where the aperture of all cracks is uniform. The format of the figure is the same as Fig. 10.

Fig. S2 Particle-tracking trajectories for the same DFN-based crack model under (a) hydrostatic and (b) triaxial stress conditions. The numbers of injected particles were 200 and 400 for the hydrostatic and triaxial cases, respectively. Inflow and outflow boundary conditions are assigned to planes perpendicular to the *z*-axis.