The complexity of monogenetic basaltic eruptions is largely governed by the shallow plumbing of the volcanoes. We present data pertaining to geometry and dynamics of plumbing features associated with two eroded monogenetic volcanoes in the Lunar Crater Volcanic Field (Nevada; USA). Intrusive bodies within the scoria cones occur predominantly as radial dikes, often with irregular shapes; some dikes are distributed in tangential and semi-circumferential patterns. Many of the dikes contain internal chilled margins and vesicle bands that suggest injection of multiple pulses of magma. We interpret the geometry and internal textures of the dikes to reflect the following processes; (1) in a Strombolian eruptive regime, the overpressure from a column of magma in the conduit pushes on the conduit wall until it ‘leaks’ into the cone, propagating outward as a radial dike. Pressure fluctuations associated with the ascent of slugs of gas through the magma column result in multiple pulses of magma into a dike once it is established. (2) in a non-explosive regime, degassed magma stagnates in the column. The weight of the degassed magma, along with pressure from new magma batches from depth, could drive dikes radially outward in multiple pulses. The dikes propagate laterally near the cone-substrate contact, and in some cases might feed lava boccas around the foot of a cone. The geometry of the dikes and the degree of connection to a central magma column have important implications for degassing patterns, gas-melt coupling, and eruption dynamics.