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Ryan Blair, Patricia Cahn* (pcahn@smith.edu) and **Alexandra Kjuchukova**. *Blowing up dihedral covers*.

A theorem of Hilden and Montesinos states that every closed, connected, orientable 3-manifold is a 3-fold dihedral cover of the 3-dimensional sphere, branched along a knot. We study 4-manifolds arising as 3-fold dihedral covers of the 4-dimensional sphere, branched along an embedded surface with cone singularities; each singularity is locally the cone on a knot. We represent such covers using a set of three 3-colored tangles, satisfying certain properties, called a singular tri-plane diagram. We describe several tangle insertion operations, which allow us to modify a singular tri-plane diagram representing a dihedral cover Y of S^4 , to get a new singular tri-plane diagram representing $Y\#X$, where X is CP^2 , with either orientation, or $S^2 \times S^2$. We discuss applications, including computing the ribbon genus of a knot. (Received August 20, 2019)