Given a large finite point set in two or three dimensions, we give upper bounds on the number of occurrences of \((k+1)\)-tuples of points with the \(k\) distances between consecutive pairs of points fixed. This can be seen as a generalization of the Erdős unit distance problem. We compare these estimates to recent work of Bennett, Iosevich, and Taylor, where related questions were studied using analytic methods. (Received July 26, 2018)