Why using a distance constraint with \( c = 0 \) is not a valid way to impose that two points coincide:

\[
(r_i^p - r_j^p)^T (r_i^p - r_j^p) = 0.
\]

\[
\Rightarrow (x_i^p - x_j^p)^2 + (y_i^p - y_j^p)^2 = 0.
\]

\[
x_i^p = r_i + A_i \bar{x}_i^p \quad \quad x_j^p = r_j + A_j \bar{x}_j^p
\]

\[
\mathbf{F}_{q_i} = 2(r_i^p - r_j^p)(r_i^p)_{\hat{q}_i} = 2(r_i^p - r_j^p)^T [\mathbf{I} \quad 2 \bar{x}_i^p]_{\hat{q}_i}
\]

\[
\mathbf{F}_{q_j} = -2(r_i^p - r_j^p)(r_j^p)_{\hat{q}_j} = -2(r_i^p - r_j^p)^T [\mathbf{I} \quad 2 \bar{x}_j^p]_{\hat{q}_j}
\]

When approaching the solution \( r_i^p \approx r_j^p \):

\[
\mathbf{F}_{q_i} = \mathbf{F}_{q_j} = [0 \quad 0 \quad 0]
\]

⇒ the Jacobian is singular, you have difficulties converging to a solution.

Additionally, the Implicit Function Theorem is useless and locally you don't have a tool to guarantee uniqueness of the solution anymore.