WHY USING A DISTANCE CONSTRAINT WITH C=0 IS NOT A VALID WAY TO IMPOSE THAT TWO POINTS COINCIDES

$$(r_i^P - r_j^P)^T (r_i^P - r_j^P) = 0$$

$$\Rightarrow \quad (x_i^P - x_j^P)^2 + (y_i^P - y_j^P)^2 = 0$$

$$r_i^P = r_i + A_i \bar{s}_i^P \qquad\qquad r_j^P = r_j + A_j \bar{s}_j^P$$

$$\Phi_{q_i} = 2(r_i^P - r_j^P)^T \cdot (r_i^P)_{q_i} = 2(r_i^P - r_j^P)^T \left[I \quad B_i \bar{s}_i^P \right]$$

$$\Phi_{q_j} = -2(r_i^P - r_j^P) \cdot (r_j^P)_q = -2(r_i^P - r_j^P) \left[I \quad B_j \bar{s}_j^P \right]$$

When approaching the solution $r_i^P \approx r_j^P \Rightarrow$

$$\Phi_{q_i} = \Phi_{q_j} = [0 \quad 0 \quad 0]$$

$\Rightarrow$ 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 you guarantee uniqueness of the solution any more.