Appendix e1
Modified recipe for gel phantom with a citrate buffer concentration of 0.2 M and pH of 4.5 (1 L) based on McDonald et al. [12] and Bu-Lin et al. [13]

1. Dissolve 19.11 g of citric acid anhydrous (Sigma-Aldrich, C 0759) and 29.57 g sodium citrate tribasic dehydrate (Sigma-Aldrich, C 4641) in 166.67 mL of deionized water.
2. Gradually add 20 g of bovine serum albumin (Sigma-Aldrich, A4503) and 333.33 mL of 30 %, 19:1 mixture of acrylamide and bis-acrylamide solution (Bio-Rad, 161-0154) and stir gently and not rapidly until the solution is homogeneous. Add deionized water if necessary, up to 400 mL.
3. Add 60 mL of glycerol (99 % w/v, Sigma-Aldrich, G5516-500ML) to the solution and stir gently until the solution is homogeneous.
4. Top up solution with deionized water to 1.0 L.
5. Dissolve into solution:
   (a) 1.00 g L-ascorbic acid (Sigma-Aldrich, A 5960)
   (b) 2.5 mL iron (II) sulfate heptahydrate (FeSO₄; from a suspension of 1.00 g FeSO₄ in 100.0 mL of deionized water; Sigma-Aldrich, F 7002)
   (c) 3.0 mL of 3.0 % v/v hydrogen peroxide (H₂O₂; dilution of 30 % w/v stock, Sigma-Aldrich, H 1009).
6. Pour the solution immediately into the phantom mold avoiding air bubbles, seal and refrigerate. Phantoms should remain refrigerated for a number of hours to preclude premature coagulation (e.g. a 50-mL sample is refrigerated for ~1 hour).

Appendix e2
Further in vitro evaluation in the gel phantom model

To further evaluate the effect of the covering membrane of the covered self-expandable metal stent (cSEMS) on bipolar radiofrequency ablation (RFA), undamaged cSEMSs (i.e. cSEMSs with an intact covering membrane) were embedded in the gel phantom model and RFA was carried out (n = 10). In all gel phantom models, an ellipsoid area of coagulation confined to the stent lumen developed (Fig. e5). No early termination of radiofrequency generation was observed. The mean cross-sectional area of coagulation was 53.2 ± 5.5 mm² (P<0.001 compared with that of the plain gel phantoms).