A family of new instruments for laparoscopic radiofrequency ablation of malignant liver lesions.

Abstract:
Primary and secondary liver tumors may be treated with radiofrequency ablation (RFA) to improve tumor control and to increase patient survival. Lesions are punctured percutaneously or during open surgery. However, not all of the lesions are accessible percutaneously due to their localization: Adjacent structures could be endangered and/or the treatment would cause severe pain. Open surgery is an option in these cases but significantly more invasive. Laparoscopic RFA (LRFA) is an additional possibility in those cases: It offers a better access to difficult lesions than via the percutaneous route and is also less invasive than open surgery. The precision of targeting, however, in LRFA still has to be improved. In an in-vivo feasibility study we used a tumor mimic model in pigs to examine the applicability of laparoscopic RFA in combination with laparoscopic ultrasound using a set of dedicated new instruments to handle the RFA probe. To increase the ablation volume, the liver blood flow was reduced performing aPringle maneuver. It is demonstrated that this set of specially designed instruments is indeed applicable and facilitates the targeting of liver lesions of any localization. Accordingly, it could significantly enlarge the applicability of LRFA.