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Background: Endovascular therapy (EVT) for chronic total occlusion (CTO) of femoropopliteal arteries is still challenging. Our aim was to investigate the usefulness of the novel ultrasonography "vascular elastography (VE)" guided EVT. Method: In 815 consecutive cases which underwent EVT between April 2010 and April 2012, we focused on 73 cases of EVT for CTO of femoropopliteal arteries. We assessed lesions by "VE" with our original methods before procedure. We categorized into five types by VE score. Comparing investigation about procedure results was performed between hard group (H group: score 0-2) and soft group (S group: score 3-4). Result: We could assess elastogram of target lesions in all cases (H group: 40 vs. S group: 33 cases). Cases in S group could be penetrated with polymer jacket soft guidewire (12.1% vs. 65.2%; $p < 0.001$). Retrograde approach from popliteal artery was needed in only H group (50.0% vs. 0%; $p < 0.001$). Operation time in H group was longer than S group (152.9 ± 63.2 min vs. 87.0 ± 29.8 min; $p < 0.001$). In 10 cases, CTO site was assessed soft with thrombus. Therefore we successfully performed thrombectomy and distal protection preventing for distal embolism. Hard plaque (VE score 1-2) which difficultly penetrated without calcification by B mode of US could be assessed in 13 cases. In 15 cases with VE score 4, polymer jacket soft guidewire (Cruse) could pass the lesion easily at the site of soft appearance by VE. Conclusion: "Vascular Elastography" might be useful when we decide strategies and selections of device in EVT because we could assess the vascular morphology noninvasively before procedure.