Vascular surgery through a groin incision may be associated with severe wound healing disorders in this sensitive area. There are many options to reconstruct the defect surgically. The choice of surgical reconstruction depends mainly on the individual status of vasculature, which is most often compromised in these patients. There are random pattern flaps, as well as perforator, pedicled flaps or microvascular flaps to choose from. We give an overview of plastic surgical solutions for groin defects, with a special focus on complex wounds after vascular surgical complications. We discuss advantages and disadvantages of different flaps with two case reports and also show alternatives. We demonstrate in two cases how the reconstruction of the groin defect was planned, taking into account the vascular status, and why we chose an innovative and seldom-used option in each case. The selected flaps, a pedicled fasciocutaneous ALT propeller flap and a perforator-based, pedicled abdominal advancement flap reconstructed the defects successfully. The surgical therapy for the reconstruction of groin defects should be chosen according to the individual vascular status to ensure safe and reliable blood supply. To guarantee the best possible reconstruction and avoid postoperative healing disorders and infections, less common flaps should also be considered.