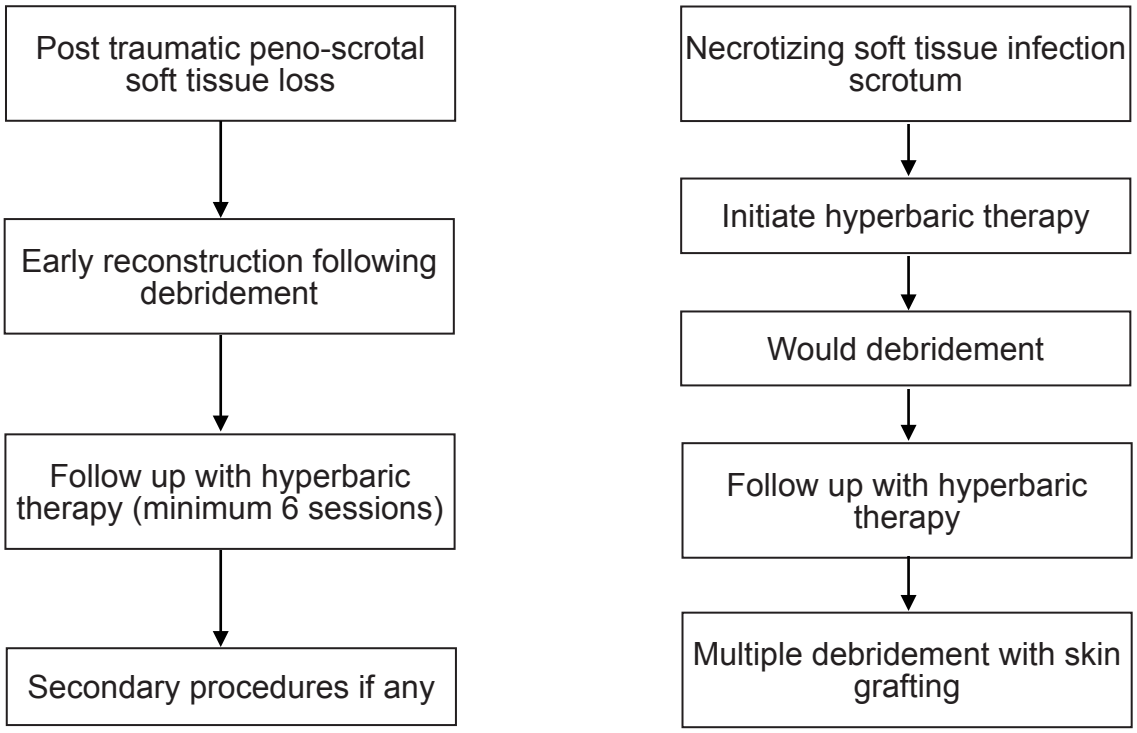

Figure 4: Algorithm devised for incorporating hyperbaric oxygen therapy into the treatment protocol of penoscrotal injuries

Pedicle gracilis muscle flap is useful in cases of unilateral or bilateral scrotal tissue loss. Gracilis muscle flap eliminates the dead space and provides appropriate padding of testicular tissue with appropriate cosmetic appearance. This well vascularized muscle flap prevents bacterial inoculums and provides optimal wound healing.[6] Superomedial thigh flap is another alternative for soft tissue reconstruction of the scrotal region. The genital branch of genitofemoral nerve and ilioinguinal provides sensation to the flap. Flap has a sensate component compared to the gracilis flap but may be bulky and may not be aesthetically pleasing. Partial wound dehiscence, serous fluid collection at the donor site, paraesthesia over the anterior part of thigh and bulky flaps were significant to note as complications in utilizing these flaps.[7] The pudendal thigh flap is another fasciocutaneous flap are relative simple for flap elevation with reliable. The donor site can be closed primarily and no muscle function is sacrificed. Other Flaps are ALT flap and vertical rectus abdominis muscle flap, which may require long transit of pedicle, microsurgical expertise, increased donor site morbidity, and may result in a bulky flap.

Gracilis muscle flap for scrotal reconstruction easily covers the scrotal defects with deep pockets. As the muscle flap is well vascularized, there is greater resistance to further infection, adequate bed for skin grafting, also eliminates the risk of skin loss associated with potentially non reliable skin paddle in the myocutaneous or fasciocutaneous flap. Donor site morbidity considerably less compared to the superiorly based medial thigh flap and the flap is aesthetically well appealing. Disadvantage of the flap is the need for microsurgical expertise for flap elevation.[8] Superiorly based medial thigh flap is early single staged sensate flap coverage. The flap has the advantage of utilizing a single lower extremity and the ipsilateral gracilis muscle flap could also be included if the defects are larger. Donor area could be closed primarily which prevents the need for skin grafts. Flap dissection is easier compared muscle flap with fewer kinks at the pedicle and dog ear formation. However, in fatty individual, it results in bulky neoscrotal bag and there will be difficulty in the transposition of the flap to the scrotal region.[9] Skin grafting to the scrotal defect is useful in Fournier's gangrene where there is adequate granulation tissue formation filling the deep pockets in the testicular region. The technique is quite simple and easily reproducible compared to the flaps. The reconstruction also provides tension-free, cosmetically appealing scrotum with complete testicular coverage. The disadvantage of skin grafting technique is that it may require multiple stages if the wound bed is not even or healthy. Deep pockets in the testicular region following trauma are difficult to cover with skin grafting procedure.[10]

Our preferred method of scrotal reconstruction in posttraumatic defect is gracilis muscle flap with skin grafting. Skin grafting is preferred for necrotizing fasciitis involving the scrotal and testicular region. Hyperbaric oxygen therapy as an adjunct enhances the recovery in both traumatic and infectious condition.

In our series, we utilized gracilis muscle flap in 3 patients with scrotal tissue loss and superomedial thigh flap in 2 patients. Patients with necrotizing soft tissue infection were managed with multiple debridement and skin