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Original Research Article

Economical on table made reusable "J" Suture passer

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ABSTRACT

Objective: To spread the knowledge about economical method and report its success with the on table, self-made, reusable suture loop with a commonly available stainless-steel wire loop.
Materials and Method: We used 0.8 mm, 1.5mm and 2mm diameter size stainless steel wires to make suture loop with simple general instruments
Results: Performed surgeries such as hip replacements capsule suturing, coracoclavicular ligament and acromioclavicular ligament reconstruction, trans calcaneal suture passage for tendo Achilles repair. Suture passage is much easier, quicker and very economical.
Conclusion: Useful to every ortho surgeon wherever trans osseous and around bone passage of suture, tendon or wire is needed. ' J ' Suture passer will save lots of money and work stress.

1. Introduction

Suture passers are quite expensive costing thousands of rupees; some are disposable and others delicate. Young surgeons, small and medium Orthopaedic setups operating for low prices cannot afford Nitinol suture passer. There are reusable straight metal suture passers also but not malleable to curve around bone. Certain authors described nylon thread suture loops pass through 18-gauge needle but are not long enough to cross the entire trans osseous tunnel and have time taking task of passing suture through needle, holding it all the while and extra risk of needle prick. "Necessity is the mother of invention". We have developed our own suture loop on table using stainless steel wire when we misplaced our Nitinol suture loop. This costs less than 50 rupees. We utilized J suture passer in 22 cases.

2. Aim and Objective

To spread the knowledge about economical method and report its success with the on table, self-made, reusable suture loop with a commonly available stainless-steel wire.

3. Materials and Methods

3.1. Technique of making the suture loop (Figure 1):

A drill and two pliers are kept ready. The needed size 0.8mm, 1.5mm and 2 mm stainless steel wire is cut more than double the length required. Bent exactly in the middle and a loop is made by turning two twists with pliers. The loop head is fed into drill tightened and held with one hand (dominant). One strand of stainless-steel wire is held with the plier in other hand. Ask the assistant to hold the second strand of stainless-steel wire with another plier. Make sure both wires are held at an angle between 90^0 and 120^0. Both wires are held tight and let the drill rotate slowly. This would ensure regular equally spaced twists without any prominence. Upon completion we have a loop end double stranded stainless-steel wire as per required strength and size for making passage.

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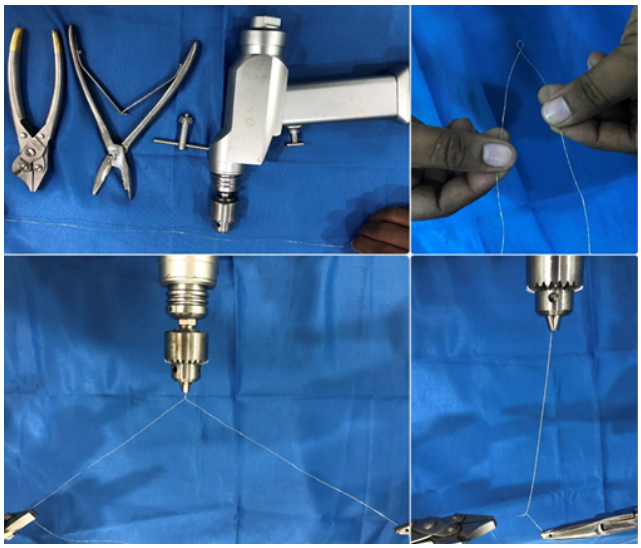

Fig. 1:

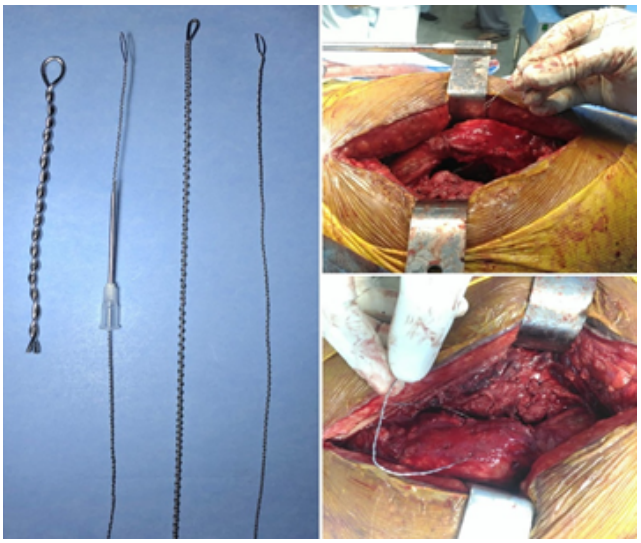

Fig. 2: (left image) Different sizes wires of different strengths. Thinner wires for trans osseous passage and thicker for contouring and passage around bone in between soft tissue.
(Right image) Passage of suture passer in a Total hip replacement case.

3.2. Methods

3.3. Performed 22 various surgeries using " J " suture passer.

Most of them were posterior capsule and external rotators attachment to posterior border of greater trochanter in hip hemiarthroplasty and total replacements.

14 Hip hemiarthroplasties and 5 total hip replacements. In these cases, four drill holes made with a 2.7 mm drill bit, thinnest J suture passer is repeatedly sent through each trans osseous tunnel and sutures are retrieved. This process takes very less time.

In 2 acromioclavicular and coracoclavicular ligament reconstructions e arlier, we used 90^0 bent forceps but to maneuver 90^0 forceps around coracoid at the position just behind pectoralis minor and behind coracoacromial ligaments. It was time taking and hard task. We utilized 1.5 mm wire suture passer bent to shape around coracoid for retrieving hamstring tendon graft with ethibond. Thinner suture passer made with 0.8 mm wire is utilized to retrieve tendon and ethibond through clavicle tunnels and acromion tunnel.

Used suture passer In 1 transcalcaneal suture and tendon retrieval for tendoachilles repair.

4. Results

Easier, quicker and hassle-free passage of sutures in all cases

5. Discussion

Suture passage can be done in many ways. One method is by utilizing a hole in the tip of metal Awl. The construct of the tip of Awl is broad and need a bigger linear hole. W hen we are passing multiple sutures, the confluence of these linear holes made by metal awl can form a stress riser and fracture. J suture passer requires only drilling with 2.7 mm drill bit making round holes. Because of flexibility of passer, holes and tracks can be made in different angles reducing confluence of holes at one place and thus reducing stress riser effect.

Second method is loop of 3-0 nylon into 18 gauze needle.[1] 5 mm to 1 cm suture loop at the tip is used to fish and retrieve suture through tunnel along with the needle. Problems encountered in this method were passage of nylon thread into needle, shortage of needle size when reaching long trans osseous tunnels e.g. transcalcaneal suture, cutting of thread at needle tip. Needle pricks inadvertently happens many a time. " J " suture passer is single functional unit, any needed length can be made on table and tip is blunt so its location can be probed with finger and retrieved without harming oneself.

Third method is putting a straight needle[2] with the ACL zig. Suture as loop is fed through eye of straight needle. Suture loop is used to retrieve. Needle prick possibility and loading of suture into eye are tasks at hand. ACL Zig should be available.

Fourth method is passing of nylon loop through IV cannula.[3] Problems encountered with this are passage of thread through cannula. Damage to tip of cannula on hitting bony wall makes its passage difficult.

5.1. In all the above methods length of suture passers are less

Fifth method is commercially available, high cost, metal tube with a nitinol suture. They are long enough and thin allowing them for long trans osseous passage, through narrow holes and tunnels. They are not flexible so can't go around bone to retrieve sutures and are highly expensive. Not autoclavable. "J" suture passer is very cheap and autoclavable.

Smaller diameter size wire loop is flexible, and as diameter increases the rigidity and strength increases and helps in passing the wire in desired direction maneuvering subperiosteal planes pushing soft tissue bluntly.

6. Conclusion

" J " suture passer is very economical, easy to learn and apply. They are Useful to every ortho surgeon wherever trans osseous and ' around bone' passage of suture, tendon or wire is needed. ' J ' Suture passer will save lots of money and work stress.

7. Source of Funding

None.

8. Conflict of Interest

None.

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