Arthroscopic arthrolysis in knee contracture with soft tissue loss

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OBJECT
Knee contracture with either flexion and / or extension loss is a common entity – particularly in developing countries with a high incidence of significant trauma especially road-traffic injuries. The situation is often worsened if mismanaged initially.

Intensive supervised and prolonged physiotherapy is often successful but there exists a subset of conditions where surgical release will be warranted. While open surgical release was earlier practiced, the advent of arthroscopic arthrolysis has opened up a whole new chapter of addressing these issues in a much more effective manner, more so in the presence of extensive peri-articular soft-tissue loss which contraindicates open procedures. We hereby report such a case and gratifying results following arthroscopic adhesiolysis.

Key words: Arthroscopic arthrolysis, adhesiolysis

INTRODUCTION
Knee contracture with either flexion and / or extension loss is quite common following significant trauma especially road-traffic injuries. The situation is compounded with initial mismanagement by way of neglect or improper decision-making.

Sometimes patients present with secondary infection as a consequence of the above or even with a synovial fistula as in the case described below. This precludes physiotherapy as an option in management with the priority being restoration of soft-tissue cover and eradication of infection and in this case a synovial fistula. By the time these issues are satisfactorily addressed, we are often left with residual contractures and loss of motion resulting from both intraarticular and periarthritic adhesions. With the widespread availability of arthroscopic services, it is time that attention was given to addressing these issues using this treatment modality.¹–⁴ We hereby report such a case and gratifying results following an arthroscopic adhesiolysis.

CASE REPORT
A young lady of 21 years age presented to the emergency department of our hospital with history of RTA and multiple wounds over (left) knee with soft-tissue loss on the medial aspect. The knee joint was exposed in an area of approximately three centimeters. She was admitted under Plastic surgery department who proceeded to debride her wound as an emergency in the operation theatre. A vacuum assisted closure (VAC) also called Negative pressure wound therapy (NPWT) was applied. Subsequently dressings were repeated on a daily basis in the ward till the wound was clean.

During this time, a synovial fistula had also developed. Hence she was again taken up for wound debridement and fistula closure. A local rotation flap followed by split skin grafting (SSG) was done. Based on culture and sensitivity from the wound, she was started on Amikacin injections.

However, as fever did not subside, the skin graft was ignored and daily dressings with Povidone Iodine 10 % and glacial acetic acid 1 % started. She was finally discharged when the wound was clean and granulating. The by-standers were taught to do similar daily dressings at home. She was advised a weekly review besides a home physiotherapy programme was started. On review at the Plastic surgery OPD (out-patient department) after a month, her wounds were totally healed. However, as there was stiffness with restricted movements, she was referred to the Orthopaedic dept for further management.
On examination, she had extensive scars all around her (left) knee with extensive soft-tissue defect medially and posteromedially with an SSG scar adherent to the bone. (Figures 1-3) There was no evidence of infection both clinically and as per laboratory parameters (TC : 5300 cells/mm³, DC : N49, L42, M3, E5, B, ESR : 13mm/hr). Range of motion (ROM) was from 20 degrees FFD to loss of terminal 50 degrees of flexion with a ‘sudden block’ after which there was no further flexion. She was advised arthroscopic arthrolysis. A full intra-articular adhesiolysis was done in a sequential manner with standard anteromedial, anterolateral and superomedial portals starting from suprapatellar pouch, extending into medial and lateral gutters as well as fat pad besides intercondylar notch. (Figure 4 & 5) It was done very carefully with the shaver blades facing away from the area of skin graft.

No attempt was made to access the posterior compartments either from within the knee or with posteromedial / posterolateral portals on account of the SSG and scarred tissues particularly posteromedially. Instead, a gentle manipulation was done and full movements were achieved. As the intra-articular appearance also was devoid of any sign of infection, 80 mg of Depomedrol (Methylprednisolone acetate 80 mg. Pfizer manufacturing, Belgium) was instilled and portals closed over a vacuum suction drain.

Post operatively, she was put on analgesics and supervised physiotherapy with twice daily sequences started (Knee mobilisation with support of opposite leg for first two days besides, CPM as tolerated was commenced.)

Full weight bearing was permitted. She was discharged after 5 days with advice to continue out-patient physiotherapy sessions till full movements were regained. Suture removal was done on 12th postoperative day. She did not review in OPD subsequently and there was no way we could trace her as she was from a far-off place and did not respond to enquiries.

She turned up in our OPD on her own exactly an year later. Examination revealed a full ROM and a fully normal gait pattern and on asking why she did not review, she said she did not feel to as she had got back to her full previous level of activity with no restrictions. (Figures 6 – 8)

**DISCUSSION**

Knee contracture with either flexion and / or extension loss is quite a common entity particularly in developing countries with a high incidence of road-traffic injuries. Arthroscopic procedures in knee are now routine Orthopaedic procedures.
Intensive supervised and prolonged physiotherapy is often successful but there exists a subset of conditions where surgical release will be mandated.\textsuperscript{2,3} There is no doubt that an intraarticular adhesiolysis is best achieved arthroscopically versus an open procedure. Besides there is the added advantage of finding the exact cause of the problem as the vision using arthroscopy is superior to an open surgery unless the incision is very long with all its attendant consequences.\textsuperscript{5,6}

There are reports of the benefits of adding a posteromedial release\textsuperscript{7,8} but we were careful to avoid it here on account of serious and extensive periarticular soft-tissue loss. A full course of supervised physiotherapy prior to surgery is always warranted, more so because this clearly identifies those with failure of conservative methods and therefore need surgical intervention.\textsuperscript{9}
Depomedrol greatly assists in dampening the inflammatory reaction of surgery and the ensuing physiotherapy, all of which can trigger recurrence of postoperative adhesions. We used this only upon being sure beyond doubt that there was no lurking infection and after making sure that the synovial fistula had long healed. In the absence of this, it is wise to avoid it altogether, since both above problems contraindicate the use of steroid preparations.

It is also wise to start gentle CPM and physiotherapy in the initial postoperative period. One also needs to counsel patients well before the surgery itself as regular reviews are highly unpredictable with these uneducated patients, often with financial constraints. We later experienced this in the above patient. It was only because we could convince them of the need to stay back till suture removal that we could at least start them on a proper physiotherapy protocol.

As always, the key issue in cases such as the above is proper preoperative planning and the decision to go ahead with surgery when conservative treatment fails. One must also look for periarticular adhesions, in which case these also need to be addressed separately after intraarticular adhesiolysis. A good arthroscopic technique of doing this is described, but in the absence of sufficient expertise, it is equally alright to do it as an open procedure provided soft-tissue cover is adequate unlike in the above case.

There are also other situations where knee contractures are seen, for example post-ACL reconstruction or Total knee replacement. Here also arthroscopic procedures are very effective. Similar is the case with contractures following chronic arthritis.

The gratifying results in this patient is an ample testimony to the effectiveness of an all-arthroscopic procedure in tackling knee contractures with extensive soft-tissue loss contraindicating open surgery.

### References