

Case Report

## Return to flying after severe multiple traumas

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### ABSTRACT

**This case report describes an attempt to successfully return a transport pilot to flying duties, made possible by excellent team work and a very positive attitude on the part of the concerned agencies.**

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Residual Orthopedic disabilities in aircrew following recovery from trauma could prove to be a major handicap when return to flying is considered. Severe multiple trauma following road traffic accident with major orthopedic injuries could pose such a problem and a multidisciplinary approach is essential to ensure that all aero medical aspects are considered before returning the crew to safe flying duties. This case report is intended to highlight the difficulties encountered, the approach and the other subtle factors involved in this important process of salvaging a flying career.

### Injury details

A transport pilot of Royal Air Force Oman (RAFO) suffered a head-on road traffic collision and was taken to the A & E Sultan Oaboos University Hospital and subsequently to Armed Forces Hospital. He was initially resuscitated with blood and fluids for his hemorrhagic shock. He was assessed to have the following injuries:

(a) Bilateral displaced fracture of ileum involving sacro-iliac joints and proximal subluxation with diastases of symphysis pubis (AO type CI 2) associated with significant retroperitoneal and intra pelvic hematoma and frank haematuria.

(b) Extensive open crush injury of right foot with multiple metatarsal and tarsal fracture subluxations.

(c) Degloving injury of the left heel with fracture calcareous and tarso-metatarsal fracture dislocation with fracture of second metatarsal. There was no circulatory compromise of the distal parts of the feet.

(d) Deep submandibular laceration extending into the oral cavity measuring about 4cm x 4 cm in a triradiate fashion.

### Surgery

He was taken to the theatre-immediately as despite resuscitation he remained unstable. He underwent emergency stabilization of his pelvis. He also had AO plating of the fracture of left ilium, plating of symphysis pubis, plating of fracture right ilium and repair of urinary bladder in surgery lasting seven hours.

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During exposure of the symphysis pubis through a Pfannenstiel incision, a 6-8 cm long vertical bladder tear was noticed. The bladder tear was repaired in two layers. There was significant retropubic and perivesical arterio-venous plexus bleeding, which was controlled with packing and later with gel foam and surgigel. Post operatively, he required an indwelling catheter for four weeks.

During the subsequent days he underwent open reduction/internal fixation of the fracture dislocation of right sacroiliac joint. He also had reduction of his left tarso-metatarsal subluxation which was stabilized with K-pins. The fracture of the right foot was also stabilized with K-pins.

### Rehabilitation

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The patient had a long course of rehabilitation in the hospital and two months after the accident he was starting to walk on his feet without any plaster and no longer required the support of a Zimmer frame. He was ready for discharge 67 days post accident when he was walking with elbow crutches and was instructed on his further rehabilitation programme which was to include full weight bearing, gait training, daily swimming and exercise bicycle work after a further 3-4 weeks.

At six months post accident he was walking well without any support although he still had some discomfort in both feet. X-rays at this stage confirmed excellent union of all pelvic ring fractures. The iliac crest plates were removed as the patient was having problem wearing trousers with a belt due to local irritation at the location of both iliac crest plates.

The officer began to improve rapidly, gaining strength day by day. This raised the question as to whether intensive specialized physiotherapy might allow him to return to flying duties. It was decided to send him to the Defence Services Medical Rehabilitation Unit (DSMRU) Headley Court, UK for evaluation and treatment.

During physiotherapy at DSMRU he continued to get pain on the dorsal aspect of the left prominence of the medial arch causing pain ranging from 2-5/10. Orthotics supplied by the Physio Dept did however help to relieve this pain. When assessed on a Leg press machine he was able to push 220 kg with both feet. Balance and strength improved during his stay and he was able to maintain bilateral heel raise. Unilateral heel raise on the right foot was poor and he was also unable to hop on the right leg. This stint with DSMRU made a significant improvement in his clinical condition and

he returned to Oman with specific instructions aimed at building up his various groups of muscles.

He was evaluated with a flying test in which his ability to apply rudder pedal force of approximately 60-80 lbs was tested. The medical officer on board the test flight thought that he was able to fly and apply the force but was getting fatigued. He also used the rudder pedals and the foot operated parking brake but experienced plantar flexion problems with his right foot. He had to adapt his own technique for applying the parking brake.

At this time, it was decided to allow him get a second spell of intensive physiotherapy at DSMRU, UK along with a simulator test on the C-130 aircraft on which he was current. On returning to DSMRU, he had well healed scars relating to surgery. Right ankle movement revealed dorsiflexion to the neutral position, plantar flexion 25 deg, subtalar movements a joggle only, power was good. Single heel raise was good, joint position sense was preserved. It was observed by the treating clinician that there was little objective improvement in mobility at the right ankle and tarsus. It seemed unlikely that he would gain more. However, his confidence, strength and balance had considerably enhanced compared to six months before. He had a limp when walking, partly because of the stiffness of his ankle and partly from discomfort for the bony prominence on the plantar surface.

Following further physiotherapy, he was evaluated on a simulator at RAF Lyneham, almost a year after his accident. It was reported that he had no functional problems in controlling the aircraft and was considered fit for flying. He was declared medically fit for full flying duties once he had regained operational status.

## Discussion

The multidisciplinary team dealing with the compromised:

A pilot: It was the pilots' sheer will power, single minded purpose and determination which were the driving factor which enabled him to return to flying. At no time from the resuscitation at the A & E to the eventual return to flying was this individual ever dejected or remorseful about his disability. His objective and the ultimate goal of returning to flying were very clear in his mind.

*B. The Surgical Team:* The team of Surgeons at the Armed Forces Hospital comprising of the Orthopedic Surgeons and the Urologists: marvelous job in performing the marathon 8 hours initial surgery followed by successive surgeries during the follow up period. They retrieved the best possible for this pilot and it was because of this excellent surgical care that the individual could be given a chance to try and fly again.

Rehabilitation Team: After the surgeons had completed *their* task, it was the role of the physiotherapists to assist in the rehabilitation process of this officer. The patient underwent extensive supervised physiotherapy Armed Force Hospital. The two stints of physiotherapy at DSMRU, UK were vital in his recovery. Intensive inpatient supervised physiotherapy specially directed with flying in mind proved a big success for this patient. This case demonstrates the enormous role physiotherapy can play in the overall management of any orthopedic disabilities.

- (d) *Flying Supervisors* : A pilot obviously requires a flying assessment before he can be considered fit for flying. This was tested both on the ground, on the simulator as well as on the aircraft to evaluate the performance of the disabled limbs. He passed these

successfully and was, therefore, cleared for flying duties.

- (e) *Authorized Medical Attendants (AMA) / Aviation Medicine Specialists:* The AMA can play a vital in the psycho social support of such an individual. Continual encouragement and reassurance of his potential to return to flying was essential. This could only be provided with credence by his AMA. The AMA emphasized the need to observe / evaluate the pilot for entry / exit from the aircraft, escape and survival capabilities and handling of emergencies especially hydraulic failures. The AMA accompanied the test flight to evaluate him with all the above in mind before a final decision on disposal was made.

## Conclusion

This case report highlights the importance of a team approach when the medical care of a pilot is involved, because each of the team members has a specific role to play which complements the others. Physiotherapy can play the vital link between the initial surgical management and the final outcome of the disability a thoughtful planned assessment of the individual keeping the flying environment in mind can ensure a safe return to flying duties.