

Analysing Accident Statistics - V

This month Alan Gibson examines the incidence of leg injuries.

Leg injuries are all too common - mainly amongst the paragliding fraternity. As in previous articles, I'm using information gleaned from the 1996 BHPA Incident Reports and the 1995 Paragliding Survey, details of which were explained in articles 1 and 2. The leg is defined as everything between the hip joint and the tip of the big toe, and we've got two of 'em. They take an enormous amount of punishment and are very well adapted to absorbing impact during running, jumping and falling. But there is a limit to what the human body can withstand, and when you get past that point things start to get painful.

Types of Injury

1996 Incident Reports showed the following:

	Paragliding	Hang gliding
Hip fracture	2	0
Femur fracture	5	1
Knee/patella fracture	2	0
Knee sprain	3	1
Tibia and/or fibula fracture	14	1
Ankle fracture	20	1
Ankle sprain	5	0
Heel/foot fracture	5	0
Bruises, etc	0	2
TOTAL	56 (in 47 pilots)	7 (in 7 pilots)

In paragliding there were 56 leg injuries out of a total of 125 (45%), the commonest region injured. In hang-gliding there were 7 leg injuries out of a total of 47 (15%), making this the third commonest region injured after arm and head. The 1995 Paragliding Survey also identified the leg as the most commonly injured region, with 34% of all paragliding injuries. The breakdown of these injuries was as follows:

Hip fracture	0%
Femur fracture	5%
Knee/patella fracture	1%
Knee sprain	8%
Tibia and/or fibula fracture	14%
Ankle fracture	33%
Ankle sprain	17%
Heel/foot fracture	9%
Bruises, etc	13%

The photographs below show X-rays of some common leg injuries and how they can be treated.



Fractured tibia & fibula treated by operating with internal steel rod (intramedullary locked nail)



Complex fracture dislocation of the ankle (arrow points to displacement of the joint)



... and the same injury after operative treatment with plate, screws & wires (internal fixation)

Severity of Injury

Of course the term 'fracture'* covers anything from minor cracks (hairline fractures) to major smashed-up bones (comminuted fractures). Many of the injuries are classified as needing urgent medical attention - there may be considerable blood-loss (e.g. in a femur fracture or where there are several fractures - five cases of similar fractures in both legs were reported), and open fractures require urgent treatment to reduce the risk of infection. Injured limbs can also swell up rapidly and this can be dangerous too.

First-Aid

All fractures.

Stabilise the fracture with appropriate splintage. The intact leg can be improvised as a splint in the absence of first-aid equipment. If the limb is wildly out of alignment (bent or twisted) and circulation is at risk, or if the skin is being pressed on, it is justified to try and straighten the leg gently (preferably by someone with some medical knowledge). Elevation is the other important thing to do, to reduce the tendency to swell.

Open fractures.

Place a pad over the wound and apply firm pressure with a bandage. Expedite transfer to hospital.

Dislocations.

True dislocations in the leg are unusual and more commonly are associated with fractures (see ankle fracture-dislocation X-ray photos, above). Patella (kneecap) dislocations may reduce easily, but a hip out of joint will need urgent reduction under general anaesthesia. There is no substitute for going on a first-aid course to get practical training - I believe every pilot should go on one. Would you like to be lying injured on some remote mountain slope with a group of heave-ho pilots milling around you without a clue what they're doing? Think about it, then sign up. But, as I said last month, don't be over-ambitious with your first-aid - you could make matters worse!

Hospital Treatment

Straightforward fractures may be managed with plaster casts for a few weeks, although some may need manipulation before casting. More complex injuries may need surgical intervention, using plates and screws or a steel rod down the centre of a long bone (see 'intramedullary nail' X-ray photo, above). This sort of procedure has largely replaced long periods in hospital with legs dangling from ropes and pulleys. Severe open fractures are often treated with an external fixator - a rigid metal frame fixed to the leg with large pins through the bone (it looks impressive!). Because of the serious infection risk, open fractures will need urgent surgical attention and antibiotics.

Recovery

In general, leg fractures take longer to heal than arm ones. Don't quote me on this (every injury is different), but someone with an uncomplicated ankle fracture should be ready to fly in about 3 - 6 months, tibia in 6 - 12, and a femur in 12 - 24. It is important that you take advice from your surgeon about this, as his opinion will be specific to your particular injury.

Prevention

If you are a hang-glider pilot and you don't want to injure your legs, stay away from paragliding and you should be OK! For paraglider pilots it's a big problem and there's no denying the likelihood of suffering a leg injury at some stage in your flying career.

Boots. When you consider that about half of all paragliding injuries in the leg are ankle fractures or sprains, the importance of good supporting footwear goes without saying. Boots should come well above the ankle and have well-cushioned soles. Purpose-made boots for free-flying are expensive, but potentially a wise investment; the ones I use have strong plastic reinforcing strips on each side of the ankle. I have no idea if they make difference but it's a nice idea. Your boots won't prevent ankle injuries, but I suspect that they may reduce injury severity in a given situation.

PLFs. The Parachute Landing Fall comes into its own when we consider leg protection. We need to be prepared to do this manoeuvre at any time we see the landing is going to be rough. I know there is a problem if you are coming down absolutely vertically, when your legs will want to crumple under you, but it should still be possible to lean over a bit and to 'force' a PLF in this rather unusual situation.

Clothing. A flying suit or equivalent will minimise cuts and grazes. Make sure you don't have hard objects in pockets that could transmit forces to the leg and even cause fractures - it has been known to happen.

Next month we are having a break (no pun intended!) - I'll be on a paragliding expedition in the Republic of Yemen. On my return, we will start looking at the thorny problem of back injuries in flying.

*Jargon-buster

Fracture a broken bone (it's the same thing!)

Crack fracture an undisplaced fracture

Open fracture bone protruding a fleshwound (was called 'compound')

Closed fracture one which doesn't! (was called 'simple')

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