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Bandaging Birds

Anne Fowler
BSc(Vet)(Hons) BVSc, MANZCVS (Avian Health, Australian Wildlife Health, Medicine of Unusual Pets)
FaunaOz Education
PO Box 152, Stirling, SA, 5152
an.fowler@bigpond.com

Abstract

The aim of this presentation is to discuss how to apply bandages to different parts of the bird. Birds in general and avian practice regularly present with injuries where bandaging is required to provide immobility for fractures, cover wounds to promote healing, or to protect areas from the beak. In this presentation, bandaging toes, legs, hands and wings, body and skull bandages will be covered. Suitable material for bandaging as well as the indication for different types of bandaging will be addressed.

Introduction

The indications for the use of bandages in birds include immobilisation of fractures in either the first-aid setting or for longer term coaptation; holding dressings onto wounds to assist in healing or to protect an area from self-trauma.

Bandages used for immobilisation of fractures must include the joints above and below the fracture to provide rigidity at the fracture site. Failure to include these joints permits ongoing movement at the fracture. Thus bandages that tape only the tips of wing feathers are the equivalent of bandaging clothing items and not limbs of injured humans and are thus not suitable for fracture immobilisation. Bandages for fractures will be heavier, similar to a Robert-Jones bandage in domestic animals, but a compromise must be reached based on patient comfort and the weight of the bandage. Ideally the fracture is immobilised in a natural pose and this is best achieved under anaesthesia or good manual restraint.

There are complications of using bandages and these should be considered with a plan to minimise these risks, just as with other animals. When bandages are used outside the first-aid setting for longer term immobilisation of a fracture, there is a risk of arthritis of the carpus and elbow joints. The patagial wing membrane may become contracted or injured by the bandage. Particularly on the leg, there is a risk that a tight bandage could constrict the blood supply and result in the loss of digits. A wound may also deteriorate under a bandage, particularly if left in place for an extended time. The simplest method to prevent complications is good application of the bandage with regular changes to monitor progress. Passive range of movement physiotherapy at weekly bandage changes will help to identify and prevent restriction in the joints or membrane.

Regular assessment of comfort begins after the initial application. Owners or care-takers should be advised to monitor for:

1. Strike-through from wounds;
2. Reluctance to eat or move;
3. Swelling of distal extremities;
4. Attacking the bandage. Often it is a change from being comfortable with the bandage to more serious attempts to remove it that give the indication that the bandage no longer comfortable and this should be investigated.

Bandages that are used to hold wound dressings by their nature are often lighter and not as stiff. It is tempting to not include extremities in these bandages, but the risk of a tourniquet of the lower parts a limb should be considered. A natural pose should be used for bandaging an area. The possible complications of these bandages is the risk of slipping of the dressing under the bandage so that the wound becomes exposed. The wound may not progress under the wound and this is not appreciated until the next bandage change. The dressing may not be suitable for the type of wound present.

Materials used in bandaging

The requirement for bandaging material is to be lightweight, and if possible, reduce the damage done to the feathers of the bird.

- The most common material used to bandage birds is a self-adhesive bandage, such as Vetrap (3M) or Coplus (Smith & Nephew). This bandage sticks to itself, while it does not stick to and thus damage the interlocking feather structures of the avian feather.

- Adhesive bandages, such as Elastoplast classic fixation tape, Leucoplast (Smith & Nephew), are not used on the feathers of the bird due to their ability to damage the barbules of the feather. This is critically important in wild bird rehabilitation. Although damage to feathers is less important with pet birds, some owners may express concern over the dishevelled appearance of the plumage. However this adhesive property is helpful on the bare skin of the lower limb of the bird.
- One tape, Micropore (Nexcare) is weakly adhesive and can be used on the bird feathers without damage to the feather structure.
- Splint materials required will vary with the size of the bird, and the creativity of the veterinarian! Anything from cotton tips, wooden tongue depressors, or various-sized syringes may be used. Commercial products such as Hexalite (Degernes, 1999) can also be conformed to the limb of the bird.
- Distractors are made from small flags of adhesive tape. Their role is to provide an item to chew. They may be applied to non-structural parts of the bandage, i.e. not tape edges that lead into the bandage.
- Wound dressing options are beyond the scope of this article. However, lightweight dressings include Melolite, Acticoat (both Smith & Nephew) and Duoderm Extrathin (Convatec) are suitable for birds.

Bandaging different parts of the body

One of the main reasons that bandages fail in birds is that they are not cut to a width that is related to the size of the area to be bandaged. Bandaging is commercially available in widths suitable for a 500kg horse lower limb, a forelimb of a 20kg dog or the finger of a 70kg human. So they need to be cut down to size for avian patients! The diameter of the bandage should be equal to the diameter of the area around where it is going. After all, the circumference of a circle, where d = diameter of circle is:

$$c=\pi d$$

By creating a bandage of the correct width for the area to be bandaged, there is a greater ability to build strength into the bandage by overlapping it by 50% on each circumference of the area. Even light-weight bandages can become strong using this method.

WING BANDAGES

Figure-of-8 bandage

Indications:

- Fractures of the radius, ulna or both;
- Fractures of the manus;
- Luxation of elbow or carpus;
- Wounds of lower wing;
- Assistance in immobilising the wing prior to body straps used for Humerus fractures.

Application:

Lie the bird in lateral recumbency with the affected wing facing up. Begin by placing the bandage UNDER the wing and bringing it up high into the axilla. Fold the short end over onto the dorsal surface of the wing and bring the long end back over the top to meet the short end. Continue to bring the long end around under the wing and under the elbow. There is debate as to whether to include the scapular covert feathers or not. If included they increase the bulk of feathers and may lead to the bandage slipping. By repeating the circle twice, this gives increased strength to the bandage and represents the large lower part of the 'eight' around the elbow. As the long end comes out, it is now time to create the small part of the 'eight' around the carpus. Circle the end around the carpus and then direct the bandage back toward the axilla. Repeat the eight pattern for a total of 2-3 times in total. More layers simply become more bulky.

Evaluation of the bandage:

- A bandage that is correct will have the primary feathers sitting UNDER the secondary feathers, as seen in the normal pose.
- A bandage that is too tight will squeeze the primary feathers to sit DORSALLY to the secondary feathers.
- A bandage that is too loose will sit the primary feathers VENTRALLY to the secondary feathers.
- Birds with short humerus, e.g.: explosive fliers of the forest (pigeons, lorikeets, etc.) are more difficult to bandage than gliding birds with a long humerus (pelagic birds, some raptors).
- Areas to monitor at bandage changes include the patagial membrane and the axilla skin.

Body strap

Indications:

- Immobilisation of Humerus fractures, which are the most common traumatic fracture in birds.
- May be used for fractures of the pectoral girdle in the first aid setting and is recommended as immobilisation for these fractures by some authors (Hatt, 2008).

Application:
The diameter of the body strap is that of the wrapped humerus and forearm of the bird. The affected wing is initially immobilised in a figure of 8 bandage. The body strap bandage is passed under the wing, up high in the axilla, across the back and run high in the opposite axilla. The bandage is brought across the breast muscles and the wing is held in the loose end of the bandage. Ensure that the legs are in extension and not bent or they will be incorporated into the bandage. The bandage is reapplied twice around the body.

Evaluation of the bandage:
- A bandage that is too tight will stop the bird from breathing as the bird uses movement of its body wall to breathe. This should be monitored for 1-2 minutes and any difficulty in breathing, the bandage should be immediately loosened and reapplied.
- A bandage that is too loose will slip down the body wall and possibly trap the stifles, leading to a 'stuffed chook' appearance - i.e.: the bird will be unable to stand and lie with its legs in extension behind the body.

Bandolier bandage

Indications:
- Fractures and wounds on the manus.

Application:
The bandage may overlie a dressing on either the dorsal or ventral surface of the hand. The bandage is wrapped over the carpometacarpal joint, which is the joint above, for immobilisation. It may be wrapped around the manus and phalanges, especially when feathers are missing as is seen in wounds.

Evaluation of the bandage:
The risk of damage to the blood supply is high for this particular bandage. The dressing should be checked daily.

BANDAGING BIRD LEGS

Stirrup bandage

Indications:
- Fractures of the femur;
- Fractures of the proximal tibiotarsus.

Application:
This dressing is similar to an Elmer sling used in domestic mammals. It appears to work better in small species, rather than large, heavy species. In this dressing, the bird's leg is bent into full flexion. The bandage then passes under the foot and over the back of the bird and returns to the foot in front of the unaffected limb. It is important to ensure that the bandage does not trap the stifle of the unaffected limb.

Evaluation of the bandage:
- It can be difficult for the bird to learn to stand;
- Check wing tips for minor abrasions daily. If present, consider application of Duoderm paste (Convatec) and transfer to a more padded enclosure or re-evaluation of the bandage.

Tibiotarsal bandage

There are two modifications of this bandage:
- This bandage can be modified by the use of a splint to create a Schroder-Thomas splint (Degernes, 1999) when padding is used at the top of the bandage and the body wall with a splint frame to support the leg. It is more useful for proximal tibiotarsal fractures but is not indicated for femur fractures.
- The tape splint is used on small birds < 30g. The tibiotarsus placed in a normal standing posture and is wedged between two flap pieces of tape, ensuring that they extend over both joints. The tape can have small splints added to it, such as cotton tips. The wound may be covered in Opsite Flexigrid (Smith & Nephew) or Tegaderm (3M). The tape can be reinforced by the application of tissue glue (Vetbond, 3M).

Indications:
- Fractures or wounds of the tibiotarsus, either as a primary method of coaptation or to support surgical repair;
- Fractures of the tarsometatarsus where the fracture is close to hock joint.

Application:
The leg should be placed in a normal position. A leg placed in extension is difficult for the bird to use while perching or standing and may result in a bird preferring to lie down. The bandage may need to begin below the tibiotarso-metatarsal joint, and is then wrapped as high as the distal third of the femur. The skin of the leg meets the inguinal skin of the body wall at this level, making it difficult to go higher up the femur. An adhesive tape may be stuck to the skin and bandage to assist in the bandage staying in place.

As the tibiotarsus is frequently fractured, it is important to note that when a splint is used, there should be a complete bandage placed around the tibiotarsus before the splint (syringe case, wooden tongue depressor, or metal rod is incorporated into the bandage. This means that if the splint fails, there is still protection and immobilisation of the fracture site and it prevents damage of the skin by the splint.

Evaluation of the bandage:

- This bandage is often not placed sufficiently high up the leg to immobilise the stifle.
- Check that the bandage is not slipping and thus freeing the stifle from the bandage.
- Immobilisation of the tibiotarso-metatarsal joint may be indicated and the thus the bandage continued further down the foot.

Bandaging the foot of the bird

Bird feet come in an array of shapes and modification of these basic bandages is often required.

Ball bandages

Indications:

- Injuries to the sole of the foot, such as pododermatitis;
- It is less common to use this bandage style to address fractures of the toes.

Application:

A true ball bandage, such as seen in human first aid, curves the toes of the bird around a central ball of absorptive material. This results in the bird either standing on the dorsal aspect of the toes or not using the foot at all. The affected area, either the sole of the foot, or toe is dressed as indicated – such as with antibiotic gels, absorptive dressings (Melolin, aloveen, gauze squares) and then packed with either cotton wool or gauze squares. Either an adhesive or non-adhesive tape is then passed between the digits to secure the toes and dressing into a ball shape. This is extended up the tarsometatarsus to assist with perching.

Evaluation of the bandage:

- The risk of the non-affected leg developing pododermatitis is high with this bandage and so the foot should be checked every day for early changes.
- If this bandage was used into the longer term, there is a risk of tendon contraction.
- The bandage should be changed daily for several days to assist in removal of necrotic tissue in cases of pododermatitis (Degernes, 1999).

Interdigitating bandage

Indication:

- Another bandage style which is more commonly used for pododermatitis.

:

This is a modification of the ball bandage where the toes are left out of the bandage so that the foot sits more flat than curved. It is commonly used in bumblefoot and may have soft padding in a doughnut shape to create a zone where there is no pressure on the plantar wound to assist in healing, similar to a 'corn' pad.
Dressings are applied to the affected area, and either soft padding (gauze or cotton), or a firm padding, such as foam is then built into the bandage (Degernes, 1999). The bandage is placed in between the toes and then rises up to immobilise the metatarsophalangeal joint.

Evaluation of the bandage:

- The bird should be able to perch, although modified wider perches may be indicated.
- The toes should not swell or darken in colour as this may indicate a compromised vascularity due to a tight bandage.

Snowshoe bandages

This could also be thought of as a foot-cast or paddle bandage style. A variety of materials from plastic, thermoplastic casts or rubber may be used to create a shoe where one or more toes are confined.

Indications:

- Injuries to digits, particularly on webbed-footed birds;
- Wounds on the sole or dorsal surface of the foot.

Application:

The area on the foot is treated as indicated. This may include gels and dressings for wounds. However, instead of bandaging the foot so that it is constricted, a cut-out of the foot in its normal resting position is made. This is then applied to the sole of the foot so that toes and webbing maintain a normal position. The bandage is incorporated to include the lower part of the metatarsus.

Toe bandages

Indications:

- Minor injury to a digit; e.g.: traumatic amputation of a nail or phalanges.

Application:

The diameter of the bandage becomes critical with narrow digits. A dressing tape that is highly adhesive should be used. The affected area may be covered with hydroactive gels, or sutured. A light dressing such as Melolite (Smith & Nephew), Algisite, Duoderm Extrathin may be applied over the area. The bandage is held in place using a stirrup bandage which is placed over the dorsal and ventral surface of the digit. The ends of this bandage may be placed around the metatarso-phalangeal joint for security. The toe is then bandaged from the distal end up the leg. The remaining toes are not included in the bandage. This appears to assist in comfort when perching.

Evaluation of the bandage:

- The toes should be checked for their ability to be placed in a normal position.
- Check the toes for swelling and congestion as this may indicate that the bandage is too tight.
- If the bandage is too loose or bulky, the bird will remove it quickly.
- A comfortable bandage will result in a bird that attempts to use it quickly.

Trunk and head bandages for birds

Skullcap bandage

Indications:

- Wounds involving degloving of the skin over the skull.

Application:

In degloving wounds of the skull, it is important to prevent the calvarium bone from desiccation. The wound is cleaned, necrotic edges debrided. Then, ideally, wherever possible, the skin is sutured to close the wound. Hydroactive creams, such as Flamazine, Duoderm paste can then be used on the edges of the wound. Dressings such as Duoderm Extrathin can be used over the area. This works best when placed in a diamond shape with the points angled over the ears, down the neck and to the front. Tissue glue (Vetbond, 3M) can be used to anchor the corners. Strips of adhesive tape, such as Hyperfix (Johnson & Johnson) can be used to extend across the bandage behind the ears. However, attention should be paid to leave the ears open and to avoid constricting the movement of the jaw.

Trunk bandages

Indications:

- Wounds on the pectoral area, e.g.: trauma, mass removal, etc.
- Surgical wounds of the abdominal wall such as celiotomy, lipoma removal.

Application:

A dressing is placed over the wound. The idea of the bandage is to cross the front of the bird from left hip to right shoulder and passing onto the back. The other side is then done. The bandage may be added in consecutive layers to move across the location of the wound. The initial layers should be done using a non-adhesive tape with the final layers incorporating an adhesive tape on the edge of the bandage contacting the skin/feathers.

Evaluation of the bandage:

- The bandage should sit on the shoulders evenly and not slide off onto the patagium;
- The dressing and bandage should sit firmly and not tightly over the wound.

Tail bandage

Indications:

- Wounds located below the vent due to crash injuries;
- This could be used for possible coccygeal injury/luxation but would need immobilisation along the dorsal spine.

Application:

The bandage needs to be close to the cloaca but sufficiently distant to permit normal defaecation without contaminating the bandage. A dressing may be held in place with a self-adhesive bandage and either end of the bandage adhered to the tail feathers with an adhesive tape.

Conclusion

By selecting the correct bandage technique for the condition and with regular changes, fractures and wounds in birds can be managed with bandaging.

References

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