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**Derek C. Knottenbelt**

BVM&S, DVM&S, MRCVS  
Philip Leverhulme Hospital  
University of Liverpool, UK



## Neoplasie della cute: i sarcoidi

*Skin neoplasia: sarcoid*

Domenica, 2 Febbraio 2003, 10.00

Sunday, February 2<sup>nd</sup> 2003, 10.00

SALA PACINOTTI

**MEDICINA INTERNA**

*Chairperson: Francesca Abramo*

## Riassunto

I sarcoidi sono di gran lunga i più comuni tumori cutanei e, in assoluto, i più frequenti tumori degli equini. La percentuale di cavalli colpiti può arrivare fino al 3-8% ed esiste un forte legame con i cavalli con alleli MHC di classe II. Non è stata stabilita alcuna predilezione di sesso, età o razza, anche se in alcuni lavori è stato ipotizzato che gli animali castrati siano colpiti con maggior frequenza e che l'interessamento degli arabi e dei purosangue sia da ritenere più probabile, ad esempio, di quello dei Quarter horse. L'autore non è riuscito a stabilire alcun comune fattore di prevalenza. Esistono variazioni geografiche e regionali nella prevalenza e nel tipo di tumori che si verificano.

Si riconoscono 6 differenti tipi tumorali, ciascuno dei quali caratterizzato da una predilezione per determinate sedi e da caratteristiche cliniche che rendono relativamente semplice la diagnosi.

1. Sarcoide occulto
2. Sarcoide verrucoso
3. Sarcoide nodulare
  - a. Tipo A: nessun coinvolgimento cutaneo
  - b. Tipo B: presenza di coinvolgimento cutaneo
4. Sarcoide fibroblastico
  - a. Tipo 1: peduncolato
  - b. Tipo 2: sessile
5. Sarcoide misto
6. Sarcoide maligno

Se possibile, la diagnosi va formulata sulla base delle sole valutazioni cliniche, anche se recentemente sono state descritte nuove tecniche che prevedono semplicemente di strisciare un tampone sul tumore ed inviare le cellule così ottenute all'analisi mediante PCR per rilevare il genoma del virus BPV1. La biopsia è da evitare, a meno che non esista una specifica ragione clinica per effettuarla, poiché il trauma o l'interferenza con il tumore può esitare in una drastica esacerbazione. Per la maggior parte dei casi in cui sullo stesso equino esistono due o più tipi differenti la diagnosi può essere formulata con una certa confidenza. Altri tipi sono così caratteristici da rendere non necessaria la diagnosi patologica.

Il trattamento è sempre problematico. La radioterapia è indubbiamente la miglior opzione possibile, ma risulta molto costosa ed estremamente difficile dal punto di vista logistico; di conseguenza, di solito viene riservata ai gravi tumori situati in sedi difficili nei cavalli di elevato valore. Le opzioni terapeutiche comprendono:

1. Escissione chirurgica
2. Necrosi mediante criochirurgia
3. Ipertermia
4. Immunomodulazione (terapia con BCG)
5. Trattamento topico con farmaci citotossici ed antimitotici quali AW4-LUDES, cisplatino, arsenico in pasta, ecc.
6. Radioterapia (teleterapia/brachiterapia interstiziale).

La prognosi deve essere sempre riservata, e, fatta eccezione per i pochi casi (< 1%) che vanno incontro a *self-cure* senza alcuna interferenza, è lecito attendersi la comparsa di recidive e nuovi tumori. Poiché i trattamenti insoddisfacenti tendono ad essere seguiti da un'esacerbazione, si deve utilizzare sin dall'inizio la migliore opzione. La prognosi risulta diminuita del 40%

per ciascun tentativo fallito e ciò significa che nella maggior parte dei metodi terapeutici non è possibile tollerare neppure un insuccesso. Un numero ridotto di casi può essere lasciato senza terapia, ma esistono rischi di trasmissione ad altre sedi del corpo del cavallo e persino ad altri cavalli (con istocompatibilità). Il ruolo delle mosche in questo processo è indicato dalla distribuzione dei sarcoidi nelle sedi in cui questi insetti si localizzano di preferenza.

Uno dei peggiori scenari per questa condizione si ha nei casi in cui la trasformazione sarcoide avviene a livello di ferite. Questa è una causa recentemente riconosciuta di insuccesso della guarigione delle ferite ed il coinvolgimento dei sarcoidi può spiegare molti casi di lesioni refrattarie che si rifiutano decisamente di guarire nonostante il miglior trattamento possibile. In tutti i casi di ferite con ipergranulazione (o indolenti) è bene inviare dei campioni di tessuto di granulazione ad un istopatologo esperto. L'identificazione degli elementi tumorali nella massa del tessuto di granulazione può essere molto problematica. Il trattamento di queste ferite è un grave problema clinico e molte di queste lesioni non guariscono mai del tutto.

## Summary

*Sarcoid is by far the commonest skin tumour and is in fact the commonest tumour of horses. Up to 3 – 8% of horses will be affected and there is a strong link to horses with class II MHC alleles. There is no established sex, age or breed predilection although in some papers there is the suggestion that geldings are more often affected and that the Arabian and the Thoroughbred are more likely to be affected than the Quarterhorse for example. This author has not been able to establish any common factors in the prevalence. There are geographical and regional variations in the prevalence and the types of tumours that occur. Six different types are recognised and each of these has predilection sites and clinical characteristics that make diagnosis relatively simple.*

1. *Occult sarcoid*
2. *Verrucose sarcoid*
3. *Nodular sarcoid*
  - a. *Type A: No skin involvement*
  - b. *Type B: Skin involvement present*
4. *Fibroblastic sarcoid*
  - a. *Type 1: Pedunculated*
  - b. *Type 2: Sessile*
5. *Mixed sarcoid*
6. *Malignant sarcoid*

*The diagnosis should if possible be made on clinical grounds alone although new techniques that involve simply wiping the tumour with a swab and subjecting the cells to a PCR for detection of BPV1 virus genome has recently been described. Biopsy should be avoided unless there is a specific clinical reason for it because trauma or interference with the tumour can result in dramatic exacerbation. For the most part where two or more different types exist on the same horse the diagnosis can be made with some confidence. Other types are so characteristic that a pathological diagnosis is not needed.*

*Treatment is always problematical. Radiation is undoubtedly the best overall option but it is very expensive and logistically very difficult – it is therefore usually reserved for serious tumours in difficult locations in valuable horses. Therapeutic options include:*

1. *Surgical excision*
2. *Cryosurgical necrosis*
3. *Hyperthermia*
4. *Immunomodulation (BCG therapy)*
5. *Topical cytotoxic and antimetabolic drugs including AW4-LUDES, Cisplatin, Arsenic paste etc.*
6. *Radiation (teletherapy / Interstitial brachytherapy)*

*The prognosis must always be guarded and with the exception of those few cases (< 1%) that self-cure without any interference at all, recurrences and new tumours are to be expected. Because of the tendency for exacerbation to follow unsatisfactory treatment the best option must be used on the first occasion. The prognosis is reduced by 40% for each failed attempt and this means that in most treatment methods a failure cannot be tolerated at all. A few cases can be left untreated but there are risks of transmission to other sites on the horse and indeed to other horses (with histocompatibility). The role of fly in this process is implied by the distribution of the sarcoids at sites where flies prefer to feed.*

*One of the worst scenarios for this condition is where sarcoid transformation takes place at wound sites. This is a recently recognised cause of wound healing failure and sarcoid involvement may explain many of the recalcitrant wounds that resolutely fail to heal in spite of the best possible wound management. It is wise in all cases of hyper-granulating (or indolent) wounds to submit specimens of the granulation tissue to a skilled pathologist. Detection of the tumour cells in the mass of granulation tissue can be very problematical. Management of these wounds is a severe clinical challenge and many affected wounds never heal at all.*

## INTRODUCTION

The equine sarcoid is probably the commonest cutaneous tumour in horses. All 6 forms of the disease have a high propensity for recurrence and become more aggressive if subject to accidental or iatrogenic interference.

The disease affects all breeds of horse, mules, donkeys and zebra. There is some evidence that the thinner-skinned breeds such as the Arabian have a particular tendency towards the condition. Furthermore there is known to be a genetic basis for the disease. Several genetic lines have known predisposition but individuals within those lines may not get sarcoids at all while others may be severely affected. While this may superficially suggest that there is some heritable aspect of the disease it is very important to realize that there are other factors that need to be present for a particular animal to get the disease. It is easy to propose that horses with sarcoids should not be used for breeding but the genetic tendency to the disease probably exists in a far higher number of horses than actually show overt sarcoid skin disease. The suggested autosomal recessive gene responsible for imparting a susceptibility to the condition influences the severity and recurrence of the disorder in an individual.

Realistically therefore we are not in any position at this time to advise that affected horses should not be used for breeding but I think it is reasonable to try to exert breeding pressure against the disease by avoiding the breeding of two affected horses.

Notwithstanding the genetic susceptibility, I believe that no horse can be considered to be totally exempt from the condition. Sex (geldings more commonly) and age (1-6 years) predilection have been proposed but recent studies suggest that there is no significant sex or age predisposition. The Quarterhorse is reported to be less susceptible while the Arabian is more so but the author has no evidence to support or deny this.

Sarcoids commonly multiply on the individual horse; sometimes very rapidly while some others remain relatively, or even completely, static for years. Interestingly, a few

individuals show spontaneous full and permanent self-cure and in my experience, spontaneous full remission (self-cure) usually means that the horse will not develop further lesions. This is the one group of horses that can probably be assumed to totally resistant. It is likely that this response has some immunological basis and this might be a very interesting line of research.

In a few cases treatment of one lesion (or a few) has resulted in clinical improvement in others at other sites. However, the course of the condition is entirely unpredictable and it is probably unwise to assume that there any invariable rules about the disorder: even the most benign-looking small lesion can erupt into a potentially catastrophic mass in a short time.

## What causes the disease?

For many years researchers have been trying to find a cause for the disease but we are still some way from a definitive answer. The role of papilloma viruses is uncertain - no patent virus particle has yet been conclusively demonstrated but a very high proportion of sarcoids have genetic material that is identical or very similar to that found in some papilloma viruses. The distribution of lesions and the epidemiology of sarcoids strongly suggest that flies are significant but how the fly and the virus are linked is another matter yet to be established.



## What does the condition look like?

Clinically and pathologically, sarcoids present most of the features of a true neoplasm; indeed I believe that it is best regarded as a form of skin cancer. Although this may not be strictly true in pathological terms it does at least suggest that the behaviour of the tumour is unpredictable and that treatment may be problematical. It is however clear that it is not a wart!

Six distinct clinical entities which are noticeably different can be recognized. Although each of these forms is commonly identifiable it is important to recognise that the "less severe" forms can rapidly progress to the more aggressive types particularly if they are traumatised. Furthermore the specific types may not be clearly identifiable in every case. It is however, patently obvious that even the mildest forms are indeed sarcoid - *in vitro* cell cultures derived from these are typical and indistinguishable from those taken from the more aggressive lesions. These factors suggest that both cell and host factors are responsible in combination for the variety of forms.

### 1. Occult sarcoid:

The predilection sites include the skin around the mouth and eyes, the neck and other relatively hairless areas of the body including the inside of the forearm, armpit and thigh. Lesions show as hairless areas, often roughly circular. They usually contain one or more small cutaneous nodules (2-5 mm diameter)

or roughened areas with a mild hyperkeratotic appearance but these may or may not be present or obvious in every case. An area of changed/altered, slightly thickened skin with thin hair coat and slight changes in hair pigment may be encountered and may be difficult to identify in winter-coated animals. The lesions are characteristically slow growing; they may progress to "wart" verrucous growths or if injured may develop rapidly into fibroblastic lesions. While the lesion remains as a static/quiescent hairless patch showing no evidence of growth in size or number of nodules, it may be wise not to interfere.

Cases have existed for over 15 years without treatment or acceleration; however extensive development of verrucose sarcoid or conversion into fibroblastic type sarcoid, usually demand immediate attention. This can occur at any time with or without apparent insult.



## 2. Verrucous (wart) sarcoid:

These lesions have a rough hyperkeratotic appearance and scaling over limited or wider areas of the body. Most often this type is seen on the face, body and groin/sheath areas. Extensive areas can be affected and are often surrounded by an area of slightly thickened /changed skin (possibly reflecting a surrounding area of early occult sarcoid) with altered, thin hair-growth pattern.

Individual lesions may be sessile (flat-based) or pedunculated (with a narrow neck) giving a true wart like appearance - indeed this type is probably the source of the name "wart" on horses. The name is of course misleadingly benign for a potentially dangerous condition. The lesions are most often slow growing and not very aggressive until injured/insulted. However, small nodules may appear at any stage or over any area of the affected skin. These may develop a true fibroblastic character whether or not they are insulted or traumatised. Rubbing, biopsy, partial excision or minor or major trauma to the surface commonly results in a dramatic change to fibroblastic sarcoid over variable areas of the lesion.

The verrucose sarcoid can be mistaken for papillomatosis (true warts), chronic blistering, severe chronic rubbing or irritation such as can be seen in a few cases of sweet itch).



## 3. Nodular sarcoid:

The lesions are easily recognisable, as firm, well-defined subcutaneous, spherical nodules of 5-20 mm diameter but can be much larger. Most often this type can be found in the groin, sheath or eyelid areas. The number of nodules varies widely - single, few, several or hundreds are common. The nodules usually lie under apparently normal skin and then may be freely movable. However, sometimes there are dermal and deep attachments, which prevent independent movement of the overlying skin and /or movement of the tumour mass relative to deeper tissue. The overlying skin may become thin over larger nodules and when these ulcerate they quickly become more aggressive fibroblastic type tumors. A similar aggressive fibroblastic response commonly follows iatrogenic or accidental or iatrogenic damage.



#### 4. Fibroblastic sarcoid:

These tumours have a characteristic fleshy appearance and this type is commonly referred to as “Angleberries” (a name that should be used only for a visually similar type of skin tumour in cattle). Predilection sites include the groin, eyelid, lower limbs and coronet, sites of skin wounds at any location and sites of any other types of sarcoid subjected to trauma or insult. Both pedunculated and extensive sessile tumours with prominent ulceration and serum exudation are commonly encountered. The latter may reflect single or repeated insults to the “lesser” forms but may develop spontaneously. They are common at sites of wounds (especially if other sarcoids are present elsewhere).

Accidental wounds that fail to heal may contain significant sarcoid components in the wound margins and admixed with granulation tissue. Surgical wounds are also liable to sarcoid development. Failure of a surgical wound to heal in a horse with sarcoids elsewhere could be associated with sarcoid transformation at the site although there are many other possible causes of the same problem. The fibroblastic proliferation at a wound site can be very extensive but an interesting feature of sarcoid transformation at wound sites is that lesions on the body trunk (that might normally expect to heal well by contraction) develop

a verrucous sarcoid while those lesions that develop at the site of limb wounds (where healing is notoriously slow and difficult and where exuberant granulation tissue develops) develop a fibroblastic lesion. Whilst there are exceptions to this rule it is a significant pathophysiological aspect.

In spite of their aggressive appearance fibroblastic sarcoids do not metastasize but can spread locally in dermis by local invasion/extension. Repeated insult (accidental or iatrogenic) encourages local sub-dermal and dermal invasion. The other major complication is the attraction that flies have to ulcerated and bleeding sarcoids. This simply provides a relatively direct and easy means of spread of sarcoid to other sites on the body and possibly even to other horses.

This type of sarcoid looks very like “proud Flesh” especially when it develops at the site of a wound and more particularly at the site of limb wounds).

#### 5. Mixed (Verrucous, Nodular and Fibroblastic) Sarcoid

This type of sarcoid probably represents a progressive/transient state between the verrucous / occult types and fibroblastic / nodular types. Variations in proportion of the several types of sarcoid is infinite and complex mixtures of any or all of the above types (contain-



*A large fibroblastic sarcoid on the face of a gelding. The lesion developed at the site of a trivial wound.*



*Mixed sarcoid lesions on the base of the ear (left) and the axilla (right).*

ing both verrucous and fibroblastic elements) are common in long standing lesions or those subjected to repeated minor trauma (such as rubbing by tack or harness). They become progressively more aggressive as more fibroblastic transformation takes place - a common consequence of biopsy or injury.

## 6. Malevolent sarcoid

This is a recently described variation<sup>1</sup> with predilection sites in the jaw, face, elbow and medial thigh areas in particular. A particularly dangerous form occurs in the immediate area around the eye. A history of repeated trauma to other types of sarcoid e.g. surgical interference is commonly described. Some cases have no such history with spontaneous development of typical multiple, locally invasive sarcoids. Others show extensive infiltration of lymphatics (cords of tumour are commonly palpable) with numerous ulcerative nodules and surface involvement as well as possible extension to local lymph nodes.

The malevolent form of sarcoid is particularly dangerous, not least because there is no current treatment for it. Its appearance is not easily mistaken for other skin diseases but again the presence of several different types of sarcoid elsewhere on the body makes the diagnosis relatively simple.

<sup>1</sup>Knottenbelt DC, Edwards SER and Daniel EA (1995) The diagnosis and treatment of the equine sarcoid In Practice (supplement to Veterinary Record) 17: 123-129.



Sarcoids generally (not only the malignant form) have a high capacity for local tissue invasion into the surrounding skin and other tissues. This is particularly dangerous in the eyelid and this problem has been highlighted by Knottenbelt and Kelly (2000)<sup>2</sup>. This local spread makes treatment very difficult and may explain why sarcoids have a bad reputation for recurrences and the development of new tumours following surgical excision or other interference. In the immediate periocular and palpebral skin the invasion means that treatment selection is very limited unless the secondary consequences of palpebral scarring, loss of function and deformity can be addressed or tolerated. In many cases these result in loss of the eye.

<sup>2</sup> Knottenbelt DC and Kelly DF (2000) Veterinary Ophthalmology.



*An aggressive fibroblastic sarcoid at the site of a wound. Note the small occult sarcoid in the axilla (arrow) that had been present for 4 years before the injury occurred some 4 weeks previously!*



*The lesion on the left is an admixture of sarcoid and granulation tissue while that on the right is pure granulation tissue. Can YOU tell the difference simply by examination?*

One of the most dangerous problems that occur with the sarcoid relates to those that develop at sites of wounds. Even a small wound on the distal limb can become a very troublesome sarcoid with a complete or partial failure of the wound to heal.

While the clinical appearance of proud flesh can be remarkably similar, treatments for the two conditions are very different. Indeed treatment that is suitable for proud flesh (cutting back and grafting) serve only to make the sarcoid even more aggressive and even more impossible to treat effectively.

Thus, wound management in all horses, and those with sarcoid skin tumours at other sites (and those with no sarcoids that are genetically susceptible to the disease) are particularly important.

### **So how can we be sure that a particular skin lesion is, in fact, a sarcoid?**

An individual lesion on a horse can be difficult to diagnose although with experience most can be recognised. The large majority of affected horses have more than one lesion and many have over 25 – 30. Multiple tumors with characteristic features of the various types of sarcoid on an individual horse make the diagnosis simple - there are no other diseases with the same range of clinical features and types. A few cases are difficult nevertheless and then biopsy is sometimes required. Some vets are understandably reluctant to interfere with a sarcoid and so may not elect to obtain a biopsy. I have much sympathy with this approach because this interference may trigger a massive and uncontrollable expansion of the lesion. Particular difficulty with diagnosis can arise when sarcoid is diffusely mixed with granulation tissue. Biopsy may be very misleading if only one of the two tissue types is recognized in the specimen. In most cases diagnosis does not require a biopsy and so treatment can be instituted immediately.

### **What treatments are there and how effective are they?**

Treatment should follow as soon after diagnosis as possible. Suspicious lesions can justifiably be treated immediately after biopsy using a suitable regimen. There are ten or more recognized treatment methods for the disease and this suggests that no one treatment is invariably effective. Indeed with the possible exception of radiation (which is largely impractical for most cases) treatments are all inadequate in some respect. What works for one vet may not work for others and so each veterinarian needs to be careful about the treatment modality selected. It is imperative however that the best possible treatment method is applied first time. The selection of an inadequate (compromise) treatment will inevitably lead to later complications and possibly even acrimony between vet and owner. It may be better to leave the lesion untreated than to interfere with an inadequate method that has little or no chance of resolving the lesion. Failure to resolve the lesion results in a drop in the prognosis of 40% for each failed attempt! Bearing in mind the rather poor prognosis from which most lesions start failure is a disaster.

The prognosis is always very guarded and owners should be made aware of the possible serious complications, which can arise both from the disease itself and from the treatment. The disease is best regarded as a form of skin cancer. Owners must be aware of the limitations, cost and likely/possible outcome of the various treatment options before embarking upon any treatment. A diagnosis of equine sarcoid has a very serious effect on the value of the horse and the likely enjoyment that the owner will get out of it.

There will be a financial commitment at some point in the large majority of cases. There is a strong likelihood that prolonged or repeated treatments will be required. We are all looking for a “sure-fire” treatment for cancers but this is a long way off yet for the equine sarcoid. No case of sarcoid can be considered to be free of the disease even following apparently successful treatment. Recurrences may take up to 25 years to occur and of course the affected horse remains liable to further sarcoid development regardless of the methods used to cure them (excepting of course the self-curing cases which remain solidly immune).

## What factors should the vet consider before selecting a treatment option?

- a) The value of the animal and the cost of treatment.

Many treatment methods are expensive and repeated treatments are commonly required. Notwithstanding the expense many owners will expect treatment regardless of the relative value of the horse.

- b) The specific site of the problem.

Some areas of the body have very limited spare skin (e.g. eyelids and the legs) while others have large muscle bulk beneath. Treatment options are very different in the two circumstances and this is further complicated by the variable nature of the sarcoids at different sites. Thus a lesion on the eyelid that looks superficial and benign may in fact be extremely dangerous but may also be relatively innocuous. There is no way of identifying which behaviour an individual lesion will take on.

- c) Previous treatments and history.

The prognosis for treatment is significantly worse if an unsuccessful attempt has been made previously. Repeated failures make the prognosis very poor. The first attempt at treatment should be directed therefore at the best available option with the highest chance of success and the lesions treated must be pursued with vigor until they are resolved.

- d) Complication through coexistence of other factors such as granulation tissue, infection, fly-strike or other tumors at the same site etc.

These may alter both the histological and clinical appearance and may be misleading. Infection is a particular problem in ulcerated or traumatized sarcoid. The local defense mechanisms seem less able to cope with the infection and so it is important to provide support for these lesions.

- e) Facilities and practicality of the available treatment option.

The best option may be economically or practically impossible. For example radia-

tion carries a good prognosis but is very restricted, requiring special conditions. Cryosurgery of multiple lesions may require prolonged general anesthesia. Very extensive lesions are virtually impossible to treat and so an early attempt is justified.

## TREATMENT METHODS

Many treatment methods have been used with varying success. The various treatment methods described below may be more or less applicable to specific types of sarcoid. Treatment must remove every single abnormal cell - leaving even one behind will inevitably, sooner or later, result in return of the tumour (often with a more aggressive form).

Currently there is no effective treatment for the malevolent form of the disease.

- **Ligation:** A ligature of nylon thread, a rubber band (or even tail hair) may be used around the base of the lesion to cut off its blood supply. This method is not feasible for flat or extensive lesions and those where the margins of the sarcoid cannot be accurately defined.
- **Surgical excision:** There is a high rate of recurrence in all except the most confined and defined lesions following surgical excision. Superficial (occult and verrucose) lesions can be effectively treated by wide excision provided that the wound can be closed and then protected during healing. Any delay in healing may be due to sarcoid regrowth. Complete or partial failure of the wound to heal within days of surgery is a common indicator of problems but sarcoid regrowth can take up to 5 or more years to recur at the site.

Notwithstanding the limitations of surgery, excision of nodular lesions carries a somewhat better prognosis provided that the procedure is performed correctly. Nodular lesions in the eyelids however are potentially very dangerous - they commonly have extensive ramifications through adjacent tissues. Surgery often fails in these cases but there are some success stories.

Fibroblastic, mixed and malevolent sarcoïds are generally not suitable for surgical excision alone. The prognosis following surgery can be improved somewhat by combining it with other modalities such as cryosurgery, topical cytotoxic compounds, intralesional cisplatin injections or radiation

- **Cryosurgery (Freezing):** Cryosurgery is commonly employed. While some veterinary surgeons have good success rates it has relatively poor overall success rates (except in the smallest and most defined lesions, which carry a reasonable success rate). Again, the whole lesion must be destroyed without any significant damage to underlying or adjacent tissues. Local scarring may have important effects on function, for example of the upper eyelid or over joints.
- **Laser surgery (CO<sub>2</sub>-YAG laser excision):** Laser excision has a relatively high success rate but again selection of the most appropriate lesions is very important. The cosmetic results are however not often acceptable. Equipment is expensive and is not commonly available.
- **Cytotoxic compounds:** These induce extensive tissue necrosis and scarring. They are easy to apply and relatively cheap. Some complex mixtures of these with antimetabolic, corticosteroid and cytotoxic drugs have a reasonable reputation.
- **Cisplatin:** This is a new method that has only recently become available in UK. Good results are reported for small fibroblastic and nodular lesions in particular but it requires repeated injection into the lesion itself. In some cases it can be used in conjunction with surgical debulking. The material itself is very dangerous to humans and so its use should be considered carefully.
- **Vaccines:** Vaccines made from pieces of the tumours have been widely used but the overall results are singularly poor; it sometimes makes the condition even worse. If it worked to any acceptable degree it would surely have become univer-

sal practice because it is a theoretically attractive option for a virus disease. As a few cases of sarcoid skin disease do resolve spontaneously it does imply that there may be some immunological effects that might be used. The problem is that we do not know what these are and furthermore we do not know how to encourage this response. It is clear that vaccines are not the most appropriate way of inducing this response.

- **Immunomodulation:** Proteins including various types of protein cell-wall fractions derived from *Bacillus Calmette-Geurin* (BCG) have been used widely for sarcoid treatment for many years. The material is injected repeatedly into the individual sarcoïds. Interestingly this method works best with nodular lesions around the eye but away from the immediate peri-ocular region and in other types of sarcoid there is less obvious benefit. Some fibroblastic lesions on the limbs may in fact become worse when treated in this way. The method is not appropriate for mixed, verrucose or occult lesions for technical reasons. A side issue of this method is the occurrence of very alarming (and possibly even fatal allergic reactions) that may occur within minutes or hours of injection. Fortunately we are aware of how to minimise this risk but nevertheless it is always there.
- **Radiation:** Radiation is the by far the most successful treatment. However, it is extremely expensive and very limited in availability. It is usually only used for smaller lesions in areas for which no other method is suitable such as the eyelids and over joints etc. If this treatment is offered owners need to be made aware of the problems that include extreme hazard to the surgeon who has to perform the procedure. Rightly, few veterinary surgeons are willing to sacrifice their own lives for a horse. In reality this treatment method is best regarded as a last resort to be used when there is no alternative.

Homeopathic remedies are often used to treat sarcoids but in my experience are very disappointing. I think it unwise to say that none of these will treat cases and so I keep an open mind. Certain natural medicines including Allo Vera, Rosemary Oil and Teetree Oil have however, been found to help a few cases. Recently 'Extrerra' (Indian Mud) has been used widely and has some efficacy in a limited number and types of sarcoid. A material known as *Camrosa* (which has no defined components) is in my opinion dangerous and should not be used – any material that will treat almost any disease in almost any animal must be viewed with some skepticism and that is certainly my experience. It is also important to know that in some cases application of remedies of various natural and homeopathic types have resulted in considerable exacerbation of the tumours. This is probably more a property of the fact that the tumours have been interfered with rather than any directly harmful effect of the remedy.

## CONCLUSION

The equine sarcoid is a cutaneous tumour only. It does not spread to internal organs and so affected horses may be perfectly normal in every other respect. However it is also clear from my experience that individual animals can be affected in less obvious ways. Some horses with few or large numbers of lesions have improved dramatically in their behaviour and performance when the lesions have been successfully treated. This implies that there may be factors associated with the condition that do indeed affect the function of other organs. As the cells do not spread into the major organs we must assume that there are chemical products that get access to the circulation and that these may sometimes have metabolic consequences.

Whenever a horse is found to have a sarcoid lesion it needs to be put into the proper perspective. If you are buying a horse you need to know that the condition is unpredictable. Before a purchaser parts with their money he/she should be sure of the insurance implications and the likelihood that treatment will be required. A single

small lesion may remain identical until the horse dies of old age but it could erupt at any time or it may herald the development of more lesions as time passes. It is clear that the fewer lesions that are present at any one time the fewer it will get. I regard it as very important that horses should be as sarcoid free as they can be over the summer months when flies are a problem. Almost every owner of a horse with sarcoids will recognise that the flies seem to congregate at the site of sarcoids. Fly worry can sometimes cause bleeding and severe worry to the horse.

Treatment at an early stage when there are few small sarcoids is in my opinion the best approach. The prospects for successful treatment are far better if the lesions are small, early and the horse is under 4-5 years of age. None of the treatment methods are cheap and none of them are certain of success – if we can resolve 50% of lesions we are doing exceptionally well. No matter how identical two lesions may appear to be, the response to treatment can be very different - no two cases respond in an identical fashion to a single treatment method. Sarcoids around the face and on the legs are particularly dangerous in almost every aspect of the disease and owners should not be unduly surprised when any selected treatment fails to help: indeed you should not be surprised if the treatment makes matters worse! Furthermore there is no current method for treating microscopic lesions – we can only treat those we can actually see. We would hope of course that eventually we might be able to find a way of making the immune processes of the patient recognise the presence of abnormal cells and reject them – this way every single cell could be detected and destroyed; there would be no more sarcoids. This is some way off yet – if it were as simple as this then we would have an answer to every cancer and disease in every species of animal! We are in desperate need of more effective treatments if we are to rid the horse of this distressing and expensive disease.

The equine sarcoid should be regarded as a form of skin cancer and should be treated seriously in every case; early veterinary consultation will help to ensure that the condition is held in check and not allowed to run rampant through the skin of a horse.