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BILATERAL LAMELLAR KERATOPLASTY IN DESCEMETOCELE TREATMENT IN DOG WITH BOTULISM BY USE OF EQUINE RENAL CAPSULE AND CONJUNCTIVAL PEDICLE GRAFT

EMPREGO DE CERATOPLASTIA LAMELAR BILATERAL NO TRATAMENTO DE DESCEMETOCELE EM CÃO COM BOTULISMO, UTILIZANDO-SE CÁPSULA RENAL EQÜINA E ENXERTO CONJUNTIVAL PEDICULADO

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CASE REPORT

SUMMARY

A 3-year-old, male mixed breed dog with botulism and bilateral descemetocele was submitted to lamellar keratoplasty with equine renal capsule preserved in glycerin in the right eye and conjunctival pedicle graft in the left eye. The evolution was satisfactory in both eyes, but better in the eye receiving the equine renal capsule, because the corneal transparence was more evident in that eye. On the other hand, the surgical period was more quickly in the eye receiving the equine renal capsule because the preparation of the conjunctival pedicle before the keratoplasty was not necessary.

Key words: *keratoplasty, cornea, descemetocele, botulism.*

RESUMO

Um animal da espécie canina, macho, de 3 anos de idade, com botulismo e descemetocele bilateral foi submetido à ceratoplastia lamelar com cápsula renal eqüina preservada em glicerina no olho direito, e enxerto conjuntival pediculado no olho esquerdo. Ambos os olhos mostraram evolução satisfatória porém, o olho receptor da cápsula renal eqüina apresentou transparência corneana mais evidente.

Palavras-chave: *ceratoplastia, córnea, descemetocele, botulismo.*

INTRODUCTION

A neurotoxin produced by ***Clostridium botulinum***, which is an anaerobic gram-positive rod, is responsible for a non-contagious disease known as botulism. The main symptom of the disease is a neuronal inferior motor disturbance, which may result into a picture of total flaccid paralysis. The alteration of the activity of cranial nerves may decrease the palpebral and pupilary reflexes (SWANGO ***et al.***, 1992). The interference of the motor enervation of the eyelids may result into a corneal drying with a severe damage to the cornea (SLATTER ***et at.***, 1990).

The cornea represents an important ocular barrier against external traumas. It also represents the fore and transparent portion of the eye. It has a variable thickness according to the species and the anatomic area (SAMUELSON, 1991); being about 0.6 and 0.95mm in dogs (HELPER, 1989). Among its functions, the maintenance of the eye shape and the light convergence, are highlighted (DYCE ***et al.***, 1990). In domestic species, 80% of the total eye

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convergence power is developed by the cornea (WARING, 1984; HELPER, 1989). Its nerves originate from ciliar nerve, which is derived from the ophthalmic nerve (DYCE ***et al.***, 1990).

Among the diseases commonly found in the cornea, the ulcerative keratitis is the most important one due to the risks it offers to the eye function. The treatment for that disease is accomplished by clinical and surgical procedures. Among the surgical ones, the keratoplasties are the most frequently employed.

The first reports on these techniques are dated from XVIII century. However, more successful techniques were presented from the second half of the present century on. Procedures with auto and homografts were conducted successfully by GUNDERSEN (1958), JENSEN (1963), DICE ***et al.*** (1973), THOFT (1977), THOFT (1982), STARTUP (1984), NASISSE (1985), BRIGHTMAN ***et al.*** (1989), PORTNOY ***et al.*** (1989), KERN (1990), SLATTER (1990), HACKER (1991), MISHRA & REDDY (1991).

Superficial keratectomies in dogs have been repaired with equine pericardium by BARROS ***et al.*** (1990), with equine renal capsule by ANDRADE (1994), with homologous peritoneum by GARCIA ***et al.*** (1996) and sardine scales by LAUS (1994). LAUS ***et al.*** (1996) and MORALES ***et al.*** (1996) studied the corneal and both conjunctival pedicle and non-pedicle grafts, and could observe that the pedicle grafts were better, since they provided with an immediate blood supply, though being indicated in deep corneal ulcers. Non-pedicle conjunctival grafts and corneal grafts were incorporated more quickly by the cornea; however, this technique would be bettered indicated for less deep ulcers.

CASE REPORT

A male dog, aging 3 years old, mixed breed with a diagnosis of botulism, was assisted at the Ophthalmogical Section of Veterinary College of São Paulo State University, UNESP, Jaboticabal-SP/ Brazil. This animal presented, as a consequence of botulism, a flaccid paralysis of the eyelids, followed by a deep bilateral corneal ulcer, with descemetocele. This case, due the severity, demanded the carrying out of a surgical treatment which under such a condition, suggested the treatment with lamellar keratoplasty.

The animal, following the routine preliminary procedures for a surgery like that, was then taken into the surgical center, being so, submitted to inhalatory anesthesia, with Halothane®, in a closed circuit. The surgical procedure was done with the use of a surgical microscope.

The conjunctival pedicle graft is well-known technique, as being highly efficient in cases like that, and it was then employed by taking as basis, what had been described by SLATTER (1990). Lamellar keratoplasty with equine renal capsule was admitted, as we have mentioned before, had already been experimentally tested by our team, according to original publishing by ANDRADE (1994). As both eyes presented an ulceration, we then decided that the choice for which eye would receive what graft, should be randomized. This way, the left eye received the conjunctival pedicle graft, and the right eye, the equine renal capsule preserved in glycerin. The post-operative treatment was done by the use of chloranphenicol ophthalmic cream employing Epitezan®, at intervals of 06 hours for 20 days, and also Atropine eyedrops at 1%, every 24 h for 4 days.

The comparison between both employed techniques was made by comparing the surgical period spent on each of them, and also the evolution of cicatrization of the corneas receiving the surgical procedures. For the study of cicatrization evolution, photophobia, ocular discharge, oedema, neovascularization, pigmentation and transparence a slit-lamp was employed, as well as the fluoresceine test which was used with the same objectives. The utilized method for that comparing evaluation, was based on graduation (Nihil: absent; discreet: +; moderate: ++; intense: +++).

Along the first fifteen days, blepharospasm, mucous-discharge, oedema and neovascularization were observed in both eyes, and according to the adopted criteria, these were moderate (++). The fluoresceine test was negative at this time in both corneas. In the right eye, more than in the left one, a granulation tissue could be noticed in the grafted area. Elapsed thirty days, it could be observed that the equine renal capsule, began to be incorporated by the cornea, and the transparence in the graft area started to appear gradually. In the eye receiving the conjunctival pedicle graft, it could be verified that there was no transparence, and the graft showed to be still very crystallized. Fifty days later, the cornea receiving the equine renal capsule, already presented itself as more transparent, whereas in the other eye, the picture was similar to what we had observed at thirty days. Four months of post-operative, the cornea receiving equine renal capsule presented to be fully repaired, the graft was no longer seen, due to its total incorporation by the cornea, and the area where it was applied presented to be much more transparent, comparing with the other cornea.

Otherwise, in the eye receiving conjunctival pedicle graft there is small anterior synechiae. (figures. 1 and 2).

RESULTS AND DISCUSSION

The ulcerative keratitis are one the most important ocular diseases. The treatment for these diseases, frequently require the utilization of surgical methods known as keratoplasties.

In the last few decades, innovating techniques have been proposed. Among them, we could highlight the employment of biological membranes. In our work, we tried to assess the results of a keratoplasty with the employment of an equine renal capsule preserved in glycerin, by comparing them with a traditional procedure, such as conjunctival pedicle graft. In relation to the pedicle graft, many have been the researchers who have presented the advantages and merits of the technique (PFEIFFER ***et al.***, 1977; THOFT, 1982; HAKAN-SON, ***et al.***,1988). These authors described that patients who had been treated with that technique, evoluted fairly well. In spite of that, they could observe that in the first fifteen days after the surgery, the patients presented blepharospasm, photophobia, ocular discharge and hyperemia.

Figura 1 - The eye receiving the equine renal capsule 4 months after surgery. Notice that there are few vessels, there is no pigmentation and the graft can no longer be seen. The corneal transparence is not perfect, but it is better than the eye receiving the conjunctival pedicle graft.

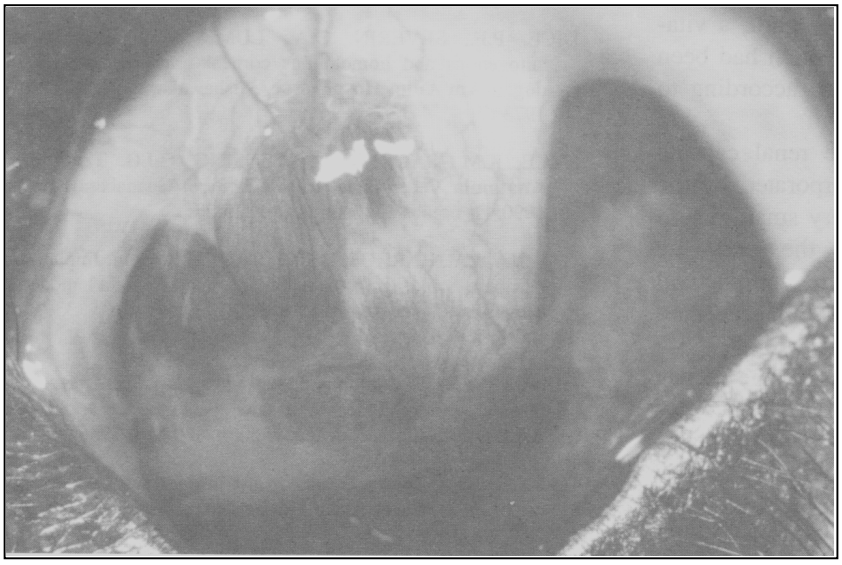

Figura 2 - The eye receiving the conjunctival pedicle graft 4 months after surgery. Notice that corneal transparence has not been damaged by the graft. There are new vessels around the graft and pigmentation.

MORALES ***et al.*** (1996), described that those findings were common and did occur indistinctively in all patients. The same author also reported that, thirty days after the surgery, the pedicle graft became very outlined and a granulation tissue could be observed in the grafted areas. As usual, these findings maintained themselves for up to fifty days, when then the cornea started to regain its transparence.

In relation to biological membranes, BARROS ***et al.*** (1990) showed good results with the employment of equine pericardium preserved in glycerin. The authors also have reported that, besides the found habitual phenomena, there was a deposit of pigments in the cornea, which had been operated. GARCIA ***et al.*** (1996) studied the homologous peritoneum and described similar results as the ones once presented by BARROS ***et al.*** (1990). Besides those works, we could bring to light the utilization of sardine scales by LAUS (1994), in which the authors

showed the occurrence of new vessels and pigments, even after having a long period of post operative been elapsed.

Generally speaking, all the authors agree that lamellar keratoplasties result into a partial loss of transparence in the sites where the grafts are implanted, due to the neo-vascular formation and pigmentation.

About this present work, whose results are being discussed, it is relevant to state at first that, it is meant to be the very first work in which clinically, the equine renal capsule was tested, because until then, it had only been experimentally tested by ANDRADE (1994).

Since the ulcers were very similar in both eyes, we decided for utilizing this case to compare a traditional surgical procedure (conjunctival pedicle graft) with lamellar keratoplasty by employing an equine renal capsule preserved in glycerin, which up to that moment, had only been tested experimentally, showing fair results. It is worth mentioning that, this comparison was only possible, because the animal´s owner allowed such a procedure.

In relation to the comparison with conjunctival pedicle graft, the post operative assessment showed that in the first fifty days, blepharospasm, ocular discharge, hyperemia and oedema were evident for both techniques. From thirty days after the post operative, the differences between both techniques began to appear. It could be observed that the equine renal capsule was incorporated by the cornea with the reduction of oedema and vascularization. In the eye receiving conjunctival pedicle graft, a vitality of the graft could be observed, which had been expected since it was a pedicle graft, according to MORALES ***et al.*** (1996).

At fifty days, the equine renal capsule could already be found totally incorporated by the cornea and the oedema was now very small. These remarks are in agreement with the ones by ANDRADE (1994). In that period, the conjunctival pedicle graft could be found still vitalized, according to MORALES ***et al.*** (1996).

Forty months after the surgery the cornea receiving renal capsule, showed a transparence degree fairly well whereas the other cornea still maintained the conjunctival graft well vitalized. It is worth mentioning that, due the severity of ulceration, we decided toward not cutting the pedicle,

Finally, by the comparative analysis one can assume that both methods were efficient. However, advantages can be granted to renal capsule. It is said for this statement, some situations or conditions in which the conjunctiva cannot be utilized as for example, in the bacterial infections of this structure, in cases in which it had been used but there was a dehiscence, and also when the ulcer occurs in equine species animals, because namely in this species the conjunctiva does not represent a fair material for the accomplishment of pedicle graft. Still about the advantages of renal capsule, we could mention a greater transparence of cornea, and the shorter time used for the accomplishment of keratoplasty. In relation to this time mentioned, it is easy to understand why it is shorter, because by using renal capsule, we do not spend any time at all on the preparation of conjunctival pedicle before the keratoplasty.

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