

Successful Eradication of Severe Abscesses in Rabbits with Long-Term Administration of Penicillin G Benzathine/Penicillin G Procaine

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One of the more serious and fairly common health problem that occurs in rabbits is the development of an abscess. Abscesses can arise anywhere in the body; internal, soft tissue, reproductive, but the most debilitating and seemingly hardest to cure are abscesses that develop in the jaw, eye, and other areas of the head. The theory of abscess treatment revolved around the now disproven fact that the *only* way to successfully treat and cure these infections was by removing all purulence and the surrounding tissue, bone, teeth, sometimes one or both eyes (enucleation). In many cases, this is impossible to do without causing debilitating effects to the rabbit. However, administering penicillin G benzathine/ penicillin G procaine on a long- term basis using fairly low, well- tolerated doses has been extensively documented and proven to eradicate the abscess and all residual infection. Excellent results have been achieved and replicated countless times by veterinarians and other rabbit experts in the US, Canada and around the world.

History and Evolution of bicillin usage

I was introduced to Bicillin C-R[®] (150K penicillin G benzathine & 150K penicillin G procaine 300,000 units/ ml, Wyeth- Ayerst) by Professor Theodore Vonieda (Dept. of Neurobiology at Northeastern Ohio Universities) in November 1986 at the Society of Neuroscience convention. His laboratory had been using the "human" form of the antibiotic for treating postoperative infection in rabbits.

There are many veterinary pharmaceutical companies that make this antibiotic combination for use in animals. The more commonly known "brand" names[®] are: Ambi-pen, Benza-pen, Benzapro, Bomacillin-LA, Combicillin-LA, Co-op, Crystiben, Dual-cillin, Duo-pen, Duplocillin, Durabiotic-LA, Dura-pen, Ethacillin, Flo-cillin, Long Acting Penicillin, Longisil, PenPB- 48, Pen-Ben 48, Pendure Neat, Penject + B, Penlong XL, and Twin-pen. Because there is no standard name for this antibiotic cocktail, I will use the name "bicillin" (small "b") for simplicity's sake.

In 1980's, our laboratory's research centered on single cell unit recording in awake, behaving animals. Postoperative infection was common in rabbits who have undergone the surgical procedure for electrophysiological recording, which involved building and cementing a recording pedestal used to hold and stabilize the rabbit's head in the proper stereotaxic plane during these recording sessions. Most rabbits (two out of three) developed an infection either around the periphery of the recording pedestal or contracted septicemia through the introduction of bacteria during the recording procedure itself. These complications usually surfaced a week or more after the surgical procedure. The post operative infection that began around the periphery of the recording pedestal would over time, penetrate and eat away at the bone, turning it to mush. Administering 0.25 cc of bicillin (approximately 75,000 units) every three days eradicated the infection after only one week of treatment. Slowly the damaged bone regrew and was replaced by healthy bone. Not one rabbit experienced side effects, no disturbance of the gut flora was noted with bicillin usage, even at higher doses (1.0 cc or 300,000 units per dose). From this time on, the use of bicillin became an integral part of the laboratory's surgical/ postoperative protocol.

Treating Severe Chronic Infection/ Abscesses

All standard treatments begin with the removal of the abscess and debriding the area. The more popular surgical options used are removal of the eye (enucleation, removal of molar spurs or sometimes the tooth or teeth and then packing the abscessed cavity with calcium hydroxide, which has been reported to cause serious tissue damage and necrosis at the affected site, or packing the cavity with 50% dextrose, or packing the affected area with antibiotic impregnated polymethyl methacrylate beads (AIPMMA), a technique analogous to radioactive seeding used in treating prostate cancer in humans. Beads impregnated with an antibiotic indicated by culture and sensitivity are implanted in affected areas, allowing the slow release of the chosen antibiotic. Because the pus (purulent) in rabbits is thick, almost the same consistency of mayonnaise and does not drain, residual "fingers" of infection are usually left behind. These pockets of infection can lead to the formation of secondary abscesses from residual bacteria left in the vicinity of the main abscess, allowing infection to continue to spread. As systemic antibiotics go, the most frequently and perhaps overprescribed drug used in treating infection in rabbits today is enrofloxacin (Baytril[®], Bayer Co.), oral and injectable. It is well- documented that abscesses contain a host of different bacteria, both aerobic and anaerobic. Enrofloxacin is not active against anaerobic bacteria so administering this antibiotic as a standard treatment for abscesses may allow the proliferation of these anaerobes. Therefore it was imperative to find a safe, effective antibiotic that does not cause side- effects in the patient. Other advantages of bicillin are that bicillin injections do not cause skin irritation or sores at the injection site and administering one injection every other day is easier on rabbit owners, most of whom have little or no experience with injections.

Protocol, Doses and Schedule of Administration

I had such success using bicillin for postoperative infection that I began to experiment, using it for other causes of infection such as wounds caused by bites from fights. It wasn't until my own pet rabbit Pal, at age seven, developed a severe infection and accompanying abscess likely caused by a scratch to his upper eyelid by his "mate". This infection innovated most of the right side of his face, coming to a head as 12 to 15 cc's of pus just above his right eye.

Because of the limited options and Pal's age, I felt that draining the abscess and administering bicillin on a long- term basis was the best initial approach for us. The other treatment options could always be employed later.

As much pus as possible was removed first with hydrogen peroxide to break down the pus. Although hydrogen peroxide has been argued to be damaging to the wound, H₂O₂ turns this purulence into liquid form that is easily suctioned from the area. After debridement, the abscess was flushed with a sterile saline + hydrogen peroxide solution and a final wash ending with a sterile isotonic saline solution. The incision was closed using New Skin (liquid bandage, Medtech[®]). Pal then received 0.50 cc (150,000 units) of Bicillin C-R administered every other day for eight weeks, then reduced to every third day for four weeks. After three months of continuous bicillin administration, Pal was declared abscess- free, suffered no relapse (2.5 years) during his lifetime and best of all kept his eye and his vision.

The bicillin protocol and accompanying dosing schedule was based on Pal's, a seven year old New Zealand, experience. Because most rabbits with infections and accompanying pain lose weight during their bout, and most bunny owners do not have scales that are sufficient to carefully monitor small increments of weight gain (grams), the dose of bicillin has been divided into two groups for administration purposes:

- **Rabbits weighing LESS than 2.50 Kgs receive 75,000 units every other day**
 - * **Rabbits weighing MORE than 2.50 Kgs receive 150,000 units every other day**
 - * **Route of administration: *subcutaneous injection***

Because the initial 12 "clinical" patients chosen for bicillin administration had undergone numerous surgeries and treatments (three to 12 surgeries per rabbit) and none successfully eradicated the infection, bacterial cultures were considered irrelevant. All veterinarians participating agreed that bicillin was their

patient's last hope and chance.

The length of treatment depends on (a) the age and health of the patient, (b) how long the patient has been ill, (c) how many different treatments & other antibiotics were used and (d) how well the infection responds to bicillin. At this point in time rabbits are being treated with bicillin using the same dosage schedule as Pal's -- eight weeks of bicillin given every other day, followed by four weeks of administration every third day.

Most rabbits responded immediately to bicillin injections, while others who had been chronically ill for some time took anywhere from three to six weeks of injections before any results were seen. Therefore it is imperative to continue the bicillin therapy and not discontinue administration too soon.

There were rabbits in which their abscesses did not respond or continued to grow while receiving the dosage stated in this paper. However, by **increasing the administration rate from every- other- day to every day eradicated the abscess** and sparing these rabbits from serious surgical intervention such as enucleation. This discovery made it possible to successfully treat rabbits with inoperable abscesses using only bicillin. Most rabbits tolerated the increase in bicillin administration without experiencing side effects, but it is recommended that rabbits with histories of gut problems, sensitivities or gastrointestinal stasis be given probiotics as a preventative measure.

In conclusion, the use of penicillin G benzathine/ procaine used as a systemic antibiotic has successfully eradicated abscess and infection in rabbits without causing debilitating side effects that other treatments tend to do. This has been proven countless times by veterinarians who have independently replicated my results by following the protocol. It has also been proven that bicillin administered as a primary antibiotic can prevent a small infection from becoming a life- threatening situation.

Other Considerations

Pain Management

A successful surgical preparation is based on the recovery of the subject, that is how long it takes to recover after the surgical procedure back to pre- surgical condition and behavior. The most important aspect when dealing with rabbits is controlling postoperative pain. Without pain relief many rabbits stop eating, raising the specter of gastrointestinal stasis and other complications. Injecting a minute amount (0.25 cc - 0.50 cc) of lidocaine HCl (Xylocaine® 1% or 2%, Astra) epidermally at the area of the incision dramatically decreases postoperative pain caused by edema and swelling by interrupting the cascading effect caused by trauma to the affected area. Lidocaine applied before any surgical procedure anaesthetizes the area for up to four hours from the initial injection time. Adding a local anesthetic to any pre- surgical preparation is an inexpensive and simple way to help alleviate or eliminate postoperative pain.

Acknowledgements

First and foremost I must thank Pat Franklin who's bunny Londo was the first "clinical" patient to be successfully treated using this protocol. Pat not only helped kept me focused on our quest during some pretty strenuous times and was also instrumental in helping many others whose bunnies were in the same dire straits. I also want to thank Dr. Anita Sabellico (Suffield Veterinary Hospital in Suffield Connecticut), the first veterinarian willing to try bicillin on a "last chance" bunny, Londo. Another big thank you goes to Christine Goodhand, her brave bunny Billy, her veterinarian Dr. Guy Carter who immediately recognized bicillin's potential and Dr. Linda Dykes (president of the BHRA) for her featured article on bicillin in the BHRA journal "Rabbiting On". I also want to thank Marti Veneziale and her bunny Bubby the second success story, Primula Nevel for her proofreading expertise, and [Bob Polewan](#), Neuroscience pre-doctoral student, UMass/ Amherst, for putting this on the internet and making this data available to the public.

Linked to this protocol are a few of the hundred plus cases, written in the bunny owner's "own words".

Contributions to this page are more than welcome and can be sent to the author. The data and subsequent results gathered can be used as an outline and guide for veterinarians interested in exploring the use of penicillin G benzathine/ procaine for their rabbit- patients and the cases illustrated help reassure bunny owners that the diagnosis of an abscess no longer means chronic illness, debilitation, or certain death.

This protocol and accompanying data will be revised and updated as more patients' case studies are reported. Questions, queries, and case study contributions can be directed to the author at petlabrabbits@webtv.net

Disclaimer: All data regarding bicillin was the accumulation of 15+ years of observation, data gathering and refinement. No abscess/ infection was induced, nor was any rabbit killed for any data associated with this work.

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