

To be on the safe side



GENTA-COLL *resorb*[®]
Collagen gentamicin sponge

Well equipped for septic...

Case history (O.L., 58 yrs, f; 2001)

Professor R. Ascherl, Medical Director of the Orthopaedic Traumatology Centre (OTZ), Park-Krankenhaus Leipzig-Südost GmbH

The patient suffered a tri-malleolar dislocation fracture of the left ankle in a skiing accident.

Primary care: repositioning and application of a non-weight-bearing below-knee plaster cast in the ski resort. After being transported to home town: haematoma, swelling, extensive soft tissue damage and fracture blisters. Delayed treatment of fracture with screws and plate osteosynthesis once the swelling had gone down and the condition of the soft tissues had improved.

Poor healing and infection around the lateral malleolus and fibula in the fourth post-operative week. Open treatment, lavages and débridements with insertion of equine collagen-gentamicin each time for haemostasis and antibiotic protection. Peroneus muscle flap. Final coverage with split skin graft seven weeks after the operation. Consolidation of the fracture. Osteitis cleared up.

Since then, full rehabilitation with slight extension deficit.

Case history (L.Ne., 63 yrs, f)

Dr K. D. Stoltze
Specialist in Surgery, Orthopaedics and Rehab. Medicine
Department of Spinal Column Surgery, SRH Krankenhaus Karlsbad

Haematogenic spondylitis C5 and C6 (Staph. aureus) with prevertebral and intraspinal abscess. Progressive infection

under conservative treatment. Incomplete tetraparesis. Surgical exploration of infection with drainage of abscess and resection of vertebral body. After microsurgical excision of the abscess membrane and decompression of the dura, haemostasis and local antibiotic applied with a collagen gentamicin sponge.

Following radical débridement, restoration of the defect with a titanium supporting body filled and enveloped with autologous cancellous bone and antibiotic.

Besides systemic therapy, local treatment of infection is an important addition to thorough surgical treatment and certainly an important factor in achieving infection-free healing and fusion of more than 90%.

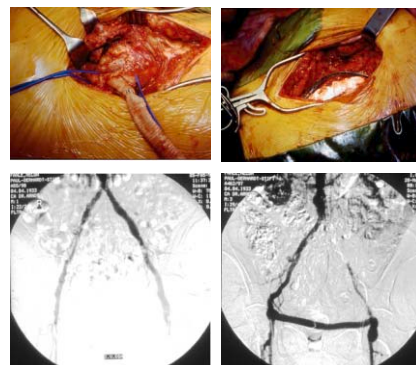
We use an equine collagen sponge (GENTA-COLL *resorb*®), possibly in combination with fibrin glue, for haemostasis and local application of antibiotic; we believe that the complications of haematoma and residual cavity formation can also be prevented in this way.

The X-rays show infection-free fusion 3 years after the operation. Regression of the tetraparesis with recovery of ability to walk, moderate residual tetraparesis, more pronounced in the lower limbs.

Case history

Collagen antibiotic combination used in deep infection after vascular reconstruction

Professor H. Zühlke, Medical Director of the Paul Gerhardt Foundation Hospital, Lutherstadt Wittenberg



This example takes the case of a 64-year-old female patient with an infected femoro-femoral cross-over graft for the reconstruction of unilaterally obstructed pelvic vasculature. Since the entire graft is infected – including the anastomosis of both the donor and the recipient artery – an aggressive approach is indicated and the vascular graft has to be explanted.

Following explantation of the infected vascular reconstruction and extensive wound débridement, the donor artery is reconstructed using an autologous venous patch. In addition, GENTA-COLL *resorb*® is inserted. The instillation of a collagen-antibiotic combination (GENTA-COLL *resorb*®) in manifest or threatening infection represents an indispensable safety measure alongside other biological surgical safety procedures, such as omentum transposition or sartorius-plasty and the targeted administration of systemic antibiotics. The prophylactic use of GENTA-COLL *resorb*® is also worthwhile as a protective measure in potentially contaminated implant sites, e.g. open vascular injuries.

... and aseptic surgery

At the recipient end, the primary obstructed aorto-iliac vascular axis has to be recanalised by retrograde disobliteration to reperfuse the extremity, which is once again ischaemic. Following retrograde disobliteration of the obstructed aorto-iliac vascular axis, the arteriotomy is also closed with a venous patch.

If this method fails, the alternative is to insert an autologous aorto/iliaco-femoral great saphenous vein by-pass graft to revascularise the affected limb. Long-term resorbable suture material is used. In addition GENTA-COLL *resorb*[®] is applied to the anastomoses and at the graft site, to ensure haemostasis of the anastomoses under antibiotic cover. In this particular patient, this procedure allowed good revascularisation of the limb and cured the infection.

Case history

Dr Heppert, Leader of the Division for Post-traumatic Osteitis, BG Unfallklinik, Ludwigshafen

32-year-old man, following a motorbike accident. In addition to a forefoot amputation, he suffered a second degree open femoral fracture and a lateral fracture of the femoral neck. Two cerclages were fitted through the medial wound of the complicated fracture. The fracture of the femur was stabilised with external fixation, the femoral neck fracture with a dynamic hip screw (figure 1). Infection set in. The pathogen was identified as MRSA.

Following débridement, a further operation with plate osteosynthesis was carried out but the infection did not abate. After 2 months' in-patient isolation (MRSA) with a total of 11 revisions, the patient requested a transfer to our hospital.

At revision, necrotic bone at the site of the initial cerclage was found to be the cause of the medial and lateral fistulas. Segmental resection was performed, after which external fixation was mounted as previously. The defect was filled with an antibiotic spacer (figure 2).

Four weeks later the spacer was removed and a cancellous bone graft performed (figure 3). This was mixed with a collagen-gentamicin sponge. We did not want to risk a segment transfer with the proximally situated hip screw because of the risk of infection along the pin track. With delayed fracture healing this could not yet be removed.

As consolidation did not occur despite good cancellous bone formation, stabilisation by means of a stable-angle implant was carried out (figure 4). This was deliberately fixed away from the débrided bone (principle of internal fixation). Because there was considerable bleeding of the bone and to prevent recurrence of infection around the plate,

the cavity between bone and plate was filled with GENTA-COLL *resorb*[®] sponge. The implant was removed after one year. A medial fistula appeared a short time afterwards. The underlying cause was found to be a cavity between the bone and the skin. After several revisions, the remaining scar tissue had no elasticity so that the cavity was closed with a flap graft. The gracilis muscle was raised and reinforced with sutures.

A transosseous channel was drilled and the muscle fixed directly to the bone after the insertion of a GENTA-COLL *resorb*[®] sponge; the cavity was sealed. The situation was clinically free of infection five months later; this was confirmed by laboratory tests and no recurrence has been demonstrated to the present day.

Radiological imaging of the healed fracture shows a correct axis and leg length (figure 5). Impeccable restructuring of the cancellous bone.

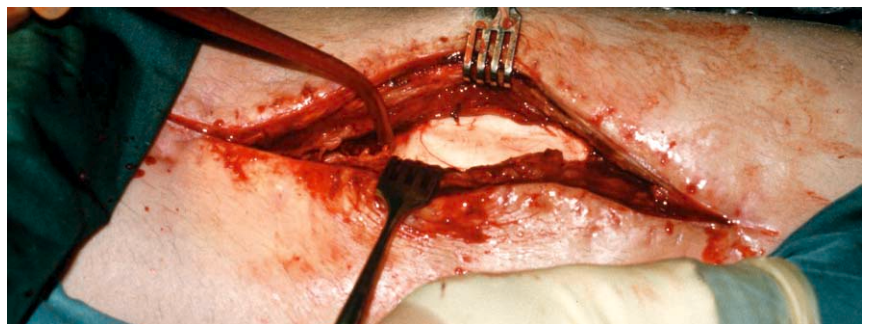


Fig. 2



Fig. 1

Fig. 3

Fig. 4

Fig. 5

The approved properties of collagen...



GENTA-COLL *resorb*®

is a haemostatic collagen sponge that contains gentamicin sulfate to protect the implant from infection.

GENTA-COLL *resorb*® is made from top-quality collagen

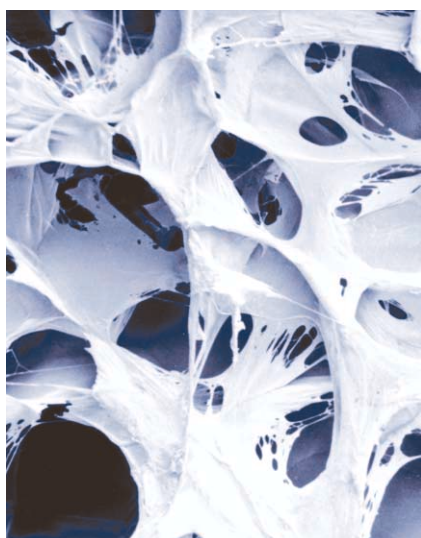
The greatest possible production safety is guaranteed by the use of collagen of equine origin.⁵

Collagen is completely resorbed.⁸

This means that there is no need for a second operation such as is required with non-resorbable materials.

The naturally-structured collagen fibrils activate clotting like endogenous collagen.⁸

- Following the contact of blood with GENTA-COLL *resorb*®, platelets aggregate on the collagen fibres and trigger the coagulation reaction.
- Once inserted, GENTA-COLL *resorb*® fills the defect and thus forms a template for tissue reaction, actively promoting the migration and adhesion of actively-dividing cells.
- GENTA-COLL *resorb*® lightly inserted into the defect prevents haematoma formation and thus reduces the risk of bacterial colonisation of the wound.
- Haemostatic
- Resorbable
- Malleable
- Ideal carrier for fibrin glue
- Highly absorbent
- Stable structure and elastic in the moist milieu of wounds



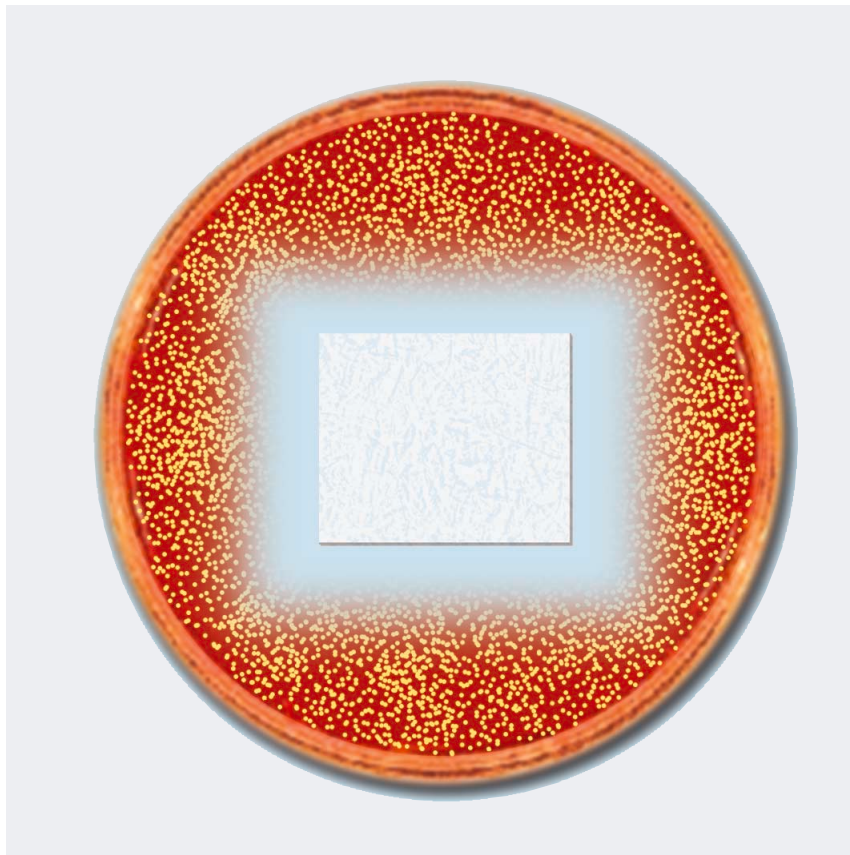
SEM image of a collagen sponge

GENTA-COLL *resorb*® is recommended for haemostasis

- In clean and contaminated wounds
- In septic surgery, e.g. revision procedures
- Where there is a high risk of infection

"Experience shows that wound healing processes are particularly favourable in precisely those areas where there is controlled and perfect haemostasis." (Ascherl, Leipzig)

...combined with antibiotic protection



Prevention of possible contamination of the collagen sponge by bacteria

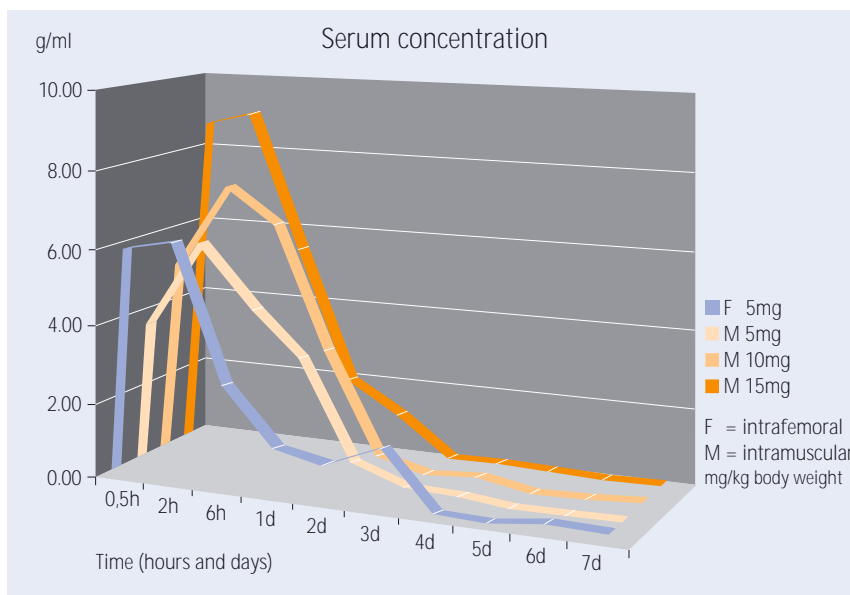
GENTA-COLL *resorb*[®]

can also be used in septic surgery thanks to its antibiotic content.

Gentamicin sulfate

Gentamicin sulfate is an aminoglycoside and has a broad spectrum of anti-bacterial activity.⁴ For certain antibiotics (e.g. aminoglycosides), the highest possible serum concentration determines the extent of the bactericidal action and the duration of the post-antibiotic effects.

It is scientifically accepted that prolonged high active substance concentrations of aminoglycosides are not to be recommended and also encourage the development of resistant bacteria. Local application means that there are initially high concentrations at the site of implantation but no toxic serum concentrations throughout the body. A study has shown that this typical effect is relatively independent of the implant surroundings or the dose applied.⁶



according to Scherer⁶

"The often-mentioned opinion that prolonged antibiotic levels are necessary in septic bone surgery is in contrast to generally recognised experience."⁹

Notes on using* GENTA-COLL *resorb*[®]



Clinical indications for use e.g.:

Traumatology / Orthopaedics

- Soft tissue wounds
- Abscess cavities
- Joint empyemas
- Cancellous bone grafts
- Bone infections
- Implant infections
- Prosthesis changes
- Spondylodiscitis
- Diabetic foot syndrome (DFS)

General surgery

- Rectal resection
- Closures of the perineal region
- Ano-rectal injuries
- Pilonidal sinus
- Parenchymal organs at risk of infection
- Abscess cavities
- Contaminated soft tissue wounds
- Definitive abdominal closure in peritonitis after staged lavage

Implant dry

- Moistening the GENTA-COLL *resorb*[®] prior to implantation reduces the haemostatic effects of the sponge.
- Moistening may lead to the premature release of the water-soluble gentamicin sulfate.

Drainage*

- Suction/rinsing drainage may lead to rapid elimination of the antibiotic and thus reduce the protection against infection.
- The collagen component may block drainage pores.

Apply lightly

- Do not compress, dress the wound lightly.

Do not remove

- A second operation to remove the GENTA-COLL *resorb*[®] is not required as the implant is completely resorbed.

In several sizes

- The available sponges can be cut to the size required.

Fibrin glue

- GENTA-COLL *resorb*[®] is an ideal carrier for fibrin glue.

*Please see instructions for use.

To be on the safe side: GENTA-COLL *resorb*[®]

GENTA-COLL *resorb*[®] is a haemostatic collagen sponge that contains the aminoglycoside antibiotic gentamicin to protect the implant from infection.

GENTA-COLL *resorb*[®] can also be used in septic surgery because of the antibiotic content.

GENTA-COLL *resorb*[®] is resorbable; it is not necessary to carry out a second operation to remove it.



Instructions for use GENTA-COLL *resorb*[®]

Collagen sponge with antibiotic protection for surgical use – haemostatic, sterile –

Composition

1 sponge 2.5 x 2.5 x 0.5 cm contains:

Collagen from equine tendons 17.5 mg

Gentamicin sulphate 12.5 mg corresponding to 6.91 – 8.94 mg gentamicin

1 sponge 5 x 5 x 0.5 cm contains:

Collagen from equine tendons 70 mg

Gentamicin sulphate 50 mg corresponding to 27.62 – 35.75 mg gentamicin

1 sponge 10 x 10 x 0.5 cm contains:

Collagen from equine tendons 280 mg

Gentamicin sulphate 200 mg corresponding to 110.5 – 143 mg gentamicin

1 cm² sponge 0.5 cm in thickness contains:

Collagen from equine tendons 2.8 mg

Gentamicin sulphate 2 mg corresponding to 1.10 – 1.43 mg gentamicin

Pharmaceutical form

Absorbable implant

Indications

GENTA-COLL *resorb*[®] is indicated for local haemostasis of capillary bleeding from parenchymatous tissue in regions with a high risk of infection.

GENTA-COLL *resorb*[®] may be applied in defect cavities and other residual cavities during surgery, as for example in the sacral cavity after rectum amputation, or for soft-tissue abscesses resulting from pilonidal sinuses.

GENTA-COLL *resorb*[®] may be applied for haemostasis in

clean, clean-contaminated and contaminated wound cavities in the presence of diffuse, capillary, arterio-venous, or arterial or venous bleeding, extensive capillary bleeding from parenchymatous organs, or as a supportive measure for other procedures for haemostasis.

GENTA-COLL *resorb*[®] may also be applied in combination with fibrin adhesives.

Dosage and Administration

After removing the focus of inflammation GENTA-COLL *resorb*[®] is applied into the defect cavity as required.

GENTA-COLL *resorb*[®] is loosely inserted as a flat sponge – either rolled or folded – or, in cases of bone defects, applied mixed with bone chips.

The collagen sponge is absorbable and need not be removed.

Haemostasis occurs on a physical basis. The contact of collagen with blood leads to aggregation of platelets which precipitate in large numbers on the collagen matrix, disintegrate, and release clotting factors which, together with plasma factors, facilitate the formation of fibrin. The collagen matrix gives additional reinforcement to the blood clot.

Due to its structure GENTA-COLL *resorb*[®] is capable of absorbing large quantities of fluid. During this purely mechanical process of absorption of secretion, rejected materials such as bacteria and fibrin clots are also removed. This accelerates the formation of granulation tissue.

The size of the defect and the weight of the patient determine the dosage of GENTA-COLL *resorb*[®]. Subject to these parameters, 1 to 3 sponges (10 x 10 cm) are generally applied for patients up to 50 kg, or a maximum of 5 sponges (10 x 10 cm) for patients over 50 kg

body weight. With smaller defects the sponge is tailored accordingly, or an appropriate number of GENTA-COLL *resorb*[®] sponges of the size 5 x 5 cm or 2.5 x 2.5 cm may be used.

GENTA-COLL *resorb*[®] is applied in a dry state with light pressure to achieve better adhesion. Because of the affinity of collagen to bleeding surfaces, dry instruments and gloves should be used when applying GENTA-COLL *resorb*[®].

The release of the incorporated gentamicin occurs simultaneously with the dissolving of the collagen sponge. This protects the implant from external contamination by bacteria ascending along the drainage as well as from contamination by bacteria spread or introduced during the surgical procedure. In cases of diffuse bleeding (e.g. in the sacral cavity) it may prove useful to apply the implant by pressing it onto the affected areas of the wound. Overpacking the wound with collagen may result in the formation of a seroma. Care should be taken to apply the sponges into the wound area in single layers only.

When using GENTA-COLL *resorb*[®] in combination with a fibrin adhesive, apply the adhesive to the surface of the sponge which will lie against the area being treated.

Contraindications

GENTA-COLL *resorb*[®] must not be used in patients with a known hypersensitivity to collagen and/or gentamicin or other aminoglycoside antibiotics.

GENTA-COLL *resorb*[®] should only be used as an adjunct to other procedures for haemostasis in the presence of bleeding requiring control by ligatures or in instances of larger arterial and/or venous haemorrhage requiring suture ligatures.

Warnings

GENTA-COLL *resorb*[®] should only be used with strict medical indications in patients with impaired renal function as well as in patients with autoimmune diseases or neuromuscular diseases such as Parkinson's or myasthenia gravis.

Although toxic serum levels are not reached during the use of GENTA-COLL *resorb*[®], both plasma gentamicin levels and plasma creatinine levels should be monitored.

The concomitant systemic administration of aminoglycoside antibiotics should be avoided or these should only be given under strict monitoring of serum gentamicin levels and renal function. Cross-sensitivity to aminoglycoside antibiotics do exist.

There is no reported experience with the use of GENTA-COLL *resorb*[®] in patients with immunological or connective tissue diseases. Although it has not been proven that the use of animal collagen results in exacerbation of the disease, GENTA-COLL *resorb*[®] should only be used with strict medical indications in these patients.

There is no reported experience with the use of GENTA-COLL *resorb*[®] in children.

Special precautions for use

To guarantee full efficacy of the product, conventional procedures for the application of a haemostatic agent should be observed. For the risk-free use of GENTA-COLL *resorb*[®] the following precautions for use should be observed:

- Soaking or moistening GENTA-COLL *resorb*[®] prior to implantation may result both in a loss of efficacy of its haemostatic properties as well as in a loss of its self-protective property through premature precipitation of the mildly watersoluble gentamicin sulphate. A reduction in the sponge's blood absorption capacity following the soaking of GENTA-COLL *resorb*[®] results in a reduction of the physical properties of platelet aggregation and thus to decisive interference with haemostasis.

- The desired platelet aggregation is also achieved by lining the wound with GENTA-COLL *resorb*[®].

- The simultaneous insertion of a suction and irrigation drain is strictly prohibited as this would rapidly eliminate the antibiotic gentamicin and lead to reduced protection by the collagen sponge against infection. The drain openings may also become blocked by fragments of collagen.

- GENTA-COLL *resorb*[®] should not be used alone. An additional antibiotic should be administered systemically.

Interactions with other medicinal products

Although only very low plasma levels are reached after implantation of GENTA-COLL *resorb*[®], the interaction of gentamicin with other medicinal products should be considered.

The concomitant administration of aminoglycosides with loop diuretics, e.g. furosemide or etacrynic

acid, should be avoided because loop diuretics themselves have an ototoxic effect. If diuretics are simultaneously administered intravenously, they may increase the concentration of gentamicin in serum or tissue and thus increase toxicity. The simultaneous or consecutive or topical application of potentially neurotoxic and/or nephrotoxic substances, e.g. cisplatin, other aminoglycosides, streptomycin, cefaloridine, viomycin, polymyxin B or polymyxin E, may increase the toxicity of gentamicin.

The simultaneous topical use of β -lactam antibiotics may result in altered activity (inactivation).

The neuromuscular blocking tendency may be increased by the simultaneous application of muscle relaxants, e.g. d-tubocurarine, suxamethonium or pancuronium, as well as by ether. A neuromuscular blockade can best be reversed by the administration of calcium salts. Should a neuromuscular blockade occur under the simultaneous application of suxamethonium in the presence of acquired or genetically determined cholinesterase deficiency, then artificial respiration will be necessary and cholinesterase must be administered.

Pregnancy and Lactation

No data on the safe use of GENTA-COLL *resorb*[®] during pregnancy and lactation are available. Aminoglycoside antibiotics cross the placenta and reach the fetus. There is therefore a risk of intra-uterine fetal damage.

Since aminoglycoside antibiotics also pass into breast milk, GENTA-COLL *resorb*[®] should also not be used during lactation, or breastfeeding should be ceased.

Effects on ability to drive and operate machines

None known as yet.

Adverse reactions

There may be increased secretion once absorption of GENTA-COLL *resorb*[®] commences in the tissue. Overflow drains should therefore be used whenever possible in cases of extensive infected cavities. Nephrotoxicity and ototoxicity may be potentiated by the simultaneous systemic administration of aminoglycoside antibiotics or in patients with impaired renal function.

Overdose

There is no appreciable increase in serum gentamicin levels when the recommended amounts of GENTA-COLL *resorb*[®] are applied. There is no information available on doses above these levels.

Plasma gentamicin levels and renal function should always be monitored when doses other than those recommended are given.

Peritoneal dialysis or haemodialysis should be considered in cases of severe intoxication.

Incompatibilities

None known as yet.

Storage

Do not store above 25°C. Protect from moisture. Keep out of the reach of children.

Shelf life, sterility

The expiry date and the batch number are imprinted on the retail pack and on the cover of the blister pack. GENTA-COLL *resorb*[®] must not be used after the expiry date. GENTA-COLL *resorb*[®] sponges removed from the protective package must not be resterilised and should therefore be discarded. The contents of unused, yet opened or damaged, packets must not be resterilised and should therefore be discarded. GENTA-COLL *resorb*[®] is intended for single use only.

Pack sizes

Pack with 5 sponges of 6.25 cm² (2.5 x 2.5 cm)

REF GC525, PZN 2476741

Pack with 5 sponges of 25 cm²

(5 x 5 cm)

REF GC55, PZN 1613271

Pack with 1 sponges of 100 cm²

(10 x 10 cm)

REF GC110, PZN 1613503

Pack with 5 sponges of 100 cm²

(10 x 10 cm)

REF GC510, PZN 1613526

Manufacturer

RESORBA Wundversorgung GmbH + Co. KG
Am Flachmoor 16
90475 Nürnberg

 1275

Date of preparation: 05/2004

Symbols and Explanations



Sterilisation method: ethylene oxide



Do not resterilise, do not reuse



Attention, see instructions for use



Batch number



Expiry date year / month

REF

Product number

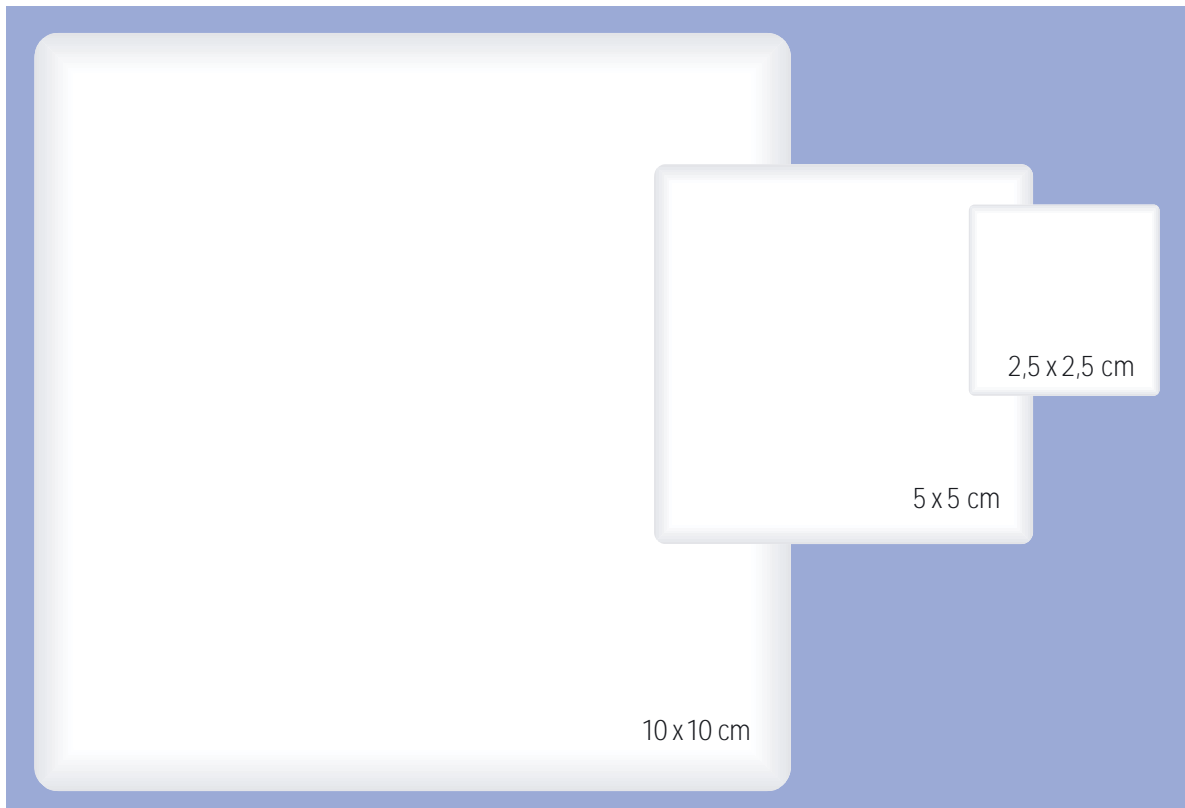
PZN

Pharmaceutical code

 1275

= CE-mark and identification number of Notified Body. Product conforms to the essential requirements of the medical device directive 93/42 EEC.

Pack sizes, presentation, composition



Shown in actual size

1 sponge

10 x 10 x 0.5 cm contains:
Collagen from horse tendons 280 mg
Gentamicin sulfate 200 mg
corresponding to 110.5 - 143 mg
gentamicin

Pack with 1 sponge, 100 cm²
REF GC110

Pack with 5 sponges, each 100 cm²
REF GC510

1 sponge

5 x 5 x 0.5 cm contains:
Collagen from horse tendons 70 mg
Gentamicin sulfate 50 mg
corresponding to 27.62 - 35.75 mg
gentamicin

Pack with 5 sponges, each 25 cm²
REF GC55

1 sponge

2.5 x 2.5 x 0.5 cm contains:
Collagen from horse tendons 17.5 mg
Gentamicin sulfate 12.5 mg
corresponding to 6.91 - 8.94 mg
gentamicin

Pack with 5 sponges, each 6.25 cm²
REF GC525

Dosage*

Depending on the size of the defect and the body weight of the patient, as a general rule:

For patients up to 50 kg body weight:
1-3 GENTA-COLL *resorb*[®] measuring 10 x 10 cm

For patients more than 50 kg body weight:
maximum 5 GENTA-COLL *resorb*[®] measuring 10 x 10 cm

For smaller defects:
use GENTA-COLL *resorb*[®] measuring 5 x 5 cm or 2.5 x 2.5 cm

*Please see instructions for use.

References

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Literatur 2, 4 und 9 beziehen sich auf das Aminoglykosid Gentamicinsulfat.

