Additional file 3 Case report details

| **Authors** | **Design** | **Age** | **Infusate** | **Intervention** | **Outcome** |
| --- | --- | --- | --- | --- | --- |
| Abraham et al. 2012[1] | **Case report** | **9 years** | **Arginine and 10% glucose** | **Cool compresses and dressings** | **Residual scar but no other complications** |
| Altan et al. 2013[2] | **Case report** | **23 days** | **Contrast agent** | **Elevation and cold compresses. Volar fasciotomy for compartmental syndrome** | **No functional complications** |
| Altmann et al. 2014[3] | **Extractable: Only 1 case (rest mixed with adult population).** | **2 years** | **Unspecified antibiotic** | 1. **Radical debridement** 2. **Wound conditioning EITHER by vacuum assisted closure (V.A.C.) OR t**emporary wound coverage by allogeneic donor-tissue grafts (unclear which) 3. **Full-thickness skin-graft** | **Full restoration of right-hand function** |
| Amano et al. 2008[4] | **Case report** | **3 years** | **Arginine monohydrochloride (10% in NaCl)** | **Conservative therapy with 1% silver sulphadiazine** | **One month after the accident the ulcer healed, leaving a slight hypertrophic scar.** |
| Amaya 2016[5] | Multiple case reports (4 patients) | **4-32 weeks old (3 preterm)** | **NR** | **Active leptospermum honey, debridement and dehydrated amniotic membrane allograft** | **Needed skin graft but no untoward effects seen (healed 21 to 41 days).** |
| Amhaz et al. 2016[6] | **Case report** | **10 days** | **Blood** | **Lipoaspiration cannula to evacuate the hematoma, elevation and compress** | **Healed over 2 weeks** |
| Aribit et al. 2000[7] | **Multiple case reports (2 patients)** | **6 and 11 months** | **Glucose 10% (1), NR (1)** | **Lipoaspiration,** Followed by local care until healed. | **Full recovery at 4 months other than post-epidermolysis dyschromia, no other trophic or neurological adverse event** |
| Baker et al. 1991[8] | **Case report** | **7 years** | **Arginine monohydrochloride (10%)** | **Elevate, cold compress. Topical silver sulphadiazine, after twice daily hydrodebridement. Surgical debridement, and skin graft.** | **Nerve and tendons destroyed. Skin graft necessary and was 98% viable fully functional after 5 days. Full function at 4 weeks.** |
| Bassi et al. 2007[9] | **Case report** | **10 months** | 6 cc arginine monohydrochloride, 50% diluted in 12 cc of sodium chloride 0.9% | **Managed conservatively. Enzymatic debridement by collagenase ointment (clostridiopeptidase A) together with local antiseptics** | **Complete resolution within 2 months with hypertrophic scar (Fig. 2). There was no need for skin grafting.** |
| Berger et al. 1974[10] | Multiple case reports (3 patients) | **2 days to one month (2 preterm)** | **All calcium gluconate** | **Soaks and mechanical debridement in 2. Antibiotics in 2** | **Took between 3 weeks and 6 months to heal depending on severity** |
| Beytut et al. 2014[11] | **Case report** | **7 years** | **NR** | **Oxygenotherapy, heat treatment and dressings with dextrose** | **12 days to full recovery** |
| Bhosale et al. 2012[12] | **Case report** | **16 years** | **Dopamine** | 4 days of antibiotics, and noradrenaline with dopamine. Followed by skin debridement and grafting. | **Needed skin graft.** |
| Borman et al. 1998[13] | **Case report** | **4 years** | **Chloramphenicol and ampicillin** | **Dermatofasciotomy, heparin infusion** | **Day 20 gangrene and amputation of hand** |
| Boyar et al. 2014[14] | **Case report** | **3 weeks (preterm)** | **NR** | **Medihoney gel and dressing** | **Healed over 3 weeks with some scarring** |
| Broom et al. 2016[15] | Multiple case reports (2 patients) | **6 months to 1 year** | **NR** | **All underwent fasciotomy for compartment syndrome** | **Both had excellent outcome** |
| Chait et al. 1975[16] | **Case report** | **2 years** | **Oncovin dauno rubicin** | **Moist dressings and elevation** | **Healed within 3 months with some scarring** |
| Chen et al. 2010[17] | **Case report** | **4 days (preterm)** | **Calcium gluconate (10%)** | **Elevation, cold packs. Oxacillin, ampicillin and gentamicin, fasciotomy (x2) for compartment syndrome, vancomycin and ceftazidime. Wet dressings.** | **Improved after 3 months** |
| Chiang et al. 2004[18] | **Case report** | **11 days (preterm)** | **Calcium gluconate (10%)** | **Elevation, cold packs, oxacillin and gentamicin, vancomycin (4 weeks)** | **Improved after 45 days** |
| Ching et al. 2014[19] | **Case report** | **4 days** | Calcium gluconate | **Managed conservatively** | **Improved after 20 weeks** |
| Cho et al. 2007[20] | Multiple case reports (5 patients) | **17 to 50 days** | **Parenteral nutrition**  **(6th case blood transfusion)** | **Antibacterial (antibiotic) ointment, sesame oil, anti-inflammatory herbal mixture, dressings (1 debridement, 1 escharectomy and oral antibiotic), Vitamin C.** | **1 mth to 2 yrs: no scar and no functional abnormalities** |
| Cohan et al. 1990[21] | Case report | **12 months** | **Iopamidol** | **Elevation and warm compresses** | **2 days to full recovery** |
| D’Acunto et al. 2015[22] | Case report | **2 months (preterm)** | **Balanced electrolyte solution** | **Elevation, proteolytic cream, escharectomy as well as autograft skin** | **Total recovery after 1 year** |
| Dave 1993[23] | Case report | **3 years** | **Undefined fluids (no drugs)** | **Wet gauze, hot packs, debridement, and skin graft** | **No long-term functional complications** |
| Davies et al. 1994[24] | Multiple case reports (2 patients) | **26 and 11 days (both preterm)** | Parenteral nutrition | **Subcutaneous hyaluronidase and saline flushing** | **Healed with minimal scarring/no sign of injury** |
| Denkler et al. 1989[25] | Case report | **1 day (preterm – two sites, hand/foot)** | **Dopamine** | **2% nitroglycerin ointment and elevation** | **Full recovery same day** |
| Domizio et al. 2006[26] | Case report | **2 days (2 sites)** | **Ampicillin (50 mg/kg/day) and Cefotaxime (100 mg/kg/die) added with 10% calcium gluconate** | **7 days later treated topically with an antibiotic-corticosteroid cream** | **20 days later, only whitish subcutaneous nodules from which tiny white pieces of calcific masses were eliminated spontaneously without signs of inflammation** |
| Dunn et al. 1984[27] | Case report | **5 months** | **Dextrose and 25% normal saline** | **Elevation** | **2 months later, no movement or feeling in parts of hand. 9 months after injury, improvement** |
| Duray et al. 1986[28] | Case report | **5 years** | **Doxorubicin** | **Excision of surrounding skin** | **Skin graft needed but healed** |
| Eckersall et al. 1996[29] | Case report | **3 years** | **Dextrose saline** | **Elevation (24 hours)** | **3 days to full recovery** |
| Eroglu et al. 2004[30] | Case report | **17 years** | **Mannitol (20%)** | **Fasciotomy for compartment syndrome** | **Fully functional, with a scar** |
| Garcia-Alverez et al. 1999[31] | **Case report** | **2 weeks (administered over first 3 days of life)** | **Calcium gluconate** | **Managed conservatively** | **Full recovery 10 weeks later** |
| Gibboney et al. 1986[32] | Multiple case reports (2 patients) | **17 days and 4 weeks (both preterm)** | **IV fluids** | **Surgical debridement and antibiotics, one received several skin grafts** | **5.5 to 9 months, healed** |
| Govind et al. 2014[33] | Case report | **27 days (preterm)** | **Parenteral nutrition (lipid infusate)** | **Incision and drainage, flushing of central line** | **18 months, healed naturally** |
| Grabois et al. 2008[34] | Case report | **19 days (preterm)** | **Sodium bicarbonate** | **Clean wound and covered with Vaseline (sterile petrolatum) for 20 days** | **Recovered after 20 days** |
| Handler 1990[35] | Case report | **4 years** | **Dextrose solution (5%), 25% saline, and KCl** | **Elevated and warm dressing.** Fasciotomy for compartment syndrome, skin graft | **Needed skin graft** |
| Hankin et al. 1984[36] | Case report | **17 years** | **Doxorubicin** | **Cold packs. Wet to dry dressings. Conservative management. Debridement after 7 months** | **Healed with contracture of arm** |
| Harb et al. 2010[37] | Case report | **1 year (preterm)** | **Erythromycin** | **Area was irrigated with saline through small punctures in the skin around the injury site. Managed initially conservatively, with regular dressing changes and delayed surgical intervention. At 3 weeks – debridement and skin graft** | **One week later – healing well** |
| Hasija et al. 2014[38] | Case report | **3 years** | **Phenytoin** | **Fasciotomy for compartment syndrome** | **After a few days, normal tissue texture and the injury was managed** |
| Hey et al. 2005[39] | Case report | **12 months** | **Azithomycin** | **Warm compresses, adaptic dressing, splint, elevation, topical antibiotics** | **Small area of unusual pigmentation, but otherwise healthy** |
| Hironaja et al. 1982[40] | Case report | **6 days** | **Calcium gluconate (10%)** | **Warm soaks, Debridement, soaks of (2%) ethylenediaminetetraacetic acid** | **At 4 months, full recovery but does not mention scarring etc.** |
| Hirsch et al. 2016[41] | Case report | **4 days (preterm)** | **Parenteral nutrition** | **Elevated, antibiotic ointment, slightly compressive gauze, 13 days debridement, collagenase, silicone dressing, splint, silver nitrite, Apligraf** | **Day 16 wound closure, At 2 years, wrist contracture** |
| Hooke 2005[42] | Case report | **Adolescent** | **Doxorubicin** | **Aspirated, cold packs dimethyl sulphoxide (DMSO) solutions topically, 3 debridements, skin graft** | **Large scar but full use of area** |
| Kameo et al. 2015[43] | Case report | **2 years** | **Vincristine** | **Hyaluronidase for 3 days, warm compresses** | **Full recovery** |
| Khan et al. 2014[44] | Case report | **29 days (preterm)** | **Parenteral nutrition** | **Hyaluronidase and** bacitracin | **After 9 days , full recovery** |
| Kishi et al. 2014[45] | Case report | **17 years** | **Hydroxyzine** | **Conservative therapy and 1% silver sulphadiazine** | **After 2.5 months, slight scarring** |
| Kuensting 2010[46] | Case report | **6 days** | **10% dextrose and 0.25% normal saline solution administered at 10mL per hour with the addition of ampicillin (135 mg every 8 hours) and cefotaxime (135mg every 8 hours)** | **Elevation and warm packs, hyaluronidase, general wound care** | **Recovered within 24 hours, discharged at 8 days.** |
| Kumar et al. 2001[47] | Multiple case reports (6 patients) | **Neonate (preterm) to 2 years** | **Flucloxacillin, calcium gluconate, human immunoglobulin, sodium bicarbonate, dextrose solution, 20% lipid nutrition** | **Dressings for 3. split skin graft and debridement for 3, elevation, warm packs.** | **2 excellent (1 with scar), 1 fair, 3 moderate scarring (1 contractures treated)** |
| Lee et al. 2013[48] | Case report | **1 month (preterm)** | **Sodium bicarbonate** | **Hyaluronidase, epithelial growth factor dressings, platelet-rich plasma dressings** | **4 days after PRP, completely healed with no limitation of movement** |
| Lehr et al. 2004[49] | Multiple case reports (3 patients) | **4 to 24 days (2 preterm)** | Parenteral nutrition (lipids) plus antibiotics | **Compression, elevation, hydroactive gel** | **Healed no complications** |
| Leung et al. 1980[50] | Case report | **6.5 years** | **Contrast medium (sodium iothalamate 54%)** | **Repeated incisions, antibiotics, excision of necrotic skin, skin grafts** | **At six months, scarring, no limits on movement** |
| Llinares et al. 2005[51] | Case report | **4 years** | **Anthracycline (idarubicin)** | **Topical DMSO and cooling, antiseptic, moisturiser** | **Pain from application but recovered. At 4 weeks, loss pigmentation and focal induration** |
| Martin et al. 1994[52] | Case report | **4 months** | 8.4% bicarbonate 20 ml, 10% calcium gluconate 10 ml, 50 % glucose 5 ml, 1:1000 adrenaline 3 ml and 4.5 % human albumin solution 50 ml. | **Hyaluronidase, liposuction and saline washout** | **2 weeks later, no signs of soft tissue damage** |
| Meszes et al. 2017[53] | Multiple case reports (6 patients) | **Neonates (1 to 23 days)** | **Fatty acid, lipid and amino acid infusion (4), glucose (1), dobutamine (1)** | **Epithelising ointment (3), hydrogels (2),**  **surgical necrectomy (1), observation (1)** | **Transfer to NICU (4), home (1), surgery (1)** |
| Mohr et al. 2014[54] | Multiple case reports (2 patients) | **3 weeks (preterm), 19 days (preterm)** | **Antibiotics, NR** | **Hyaluronidase, active leptospermum honey (ALH), hydrogel, ALH calcium alginate, silver/collagen dressings** | **No negative side effects** |
| Morrison et al. 1999[55] | Multiple case reports (4 patients) | **Neonates (preterm)** | **Calcium gluconate** | **Skin grafts** | **3 years later, visible scarring** |
| Mukherjee et al. 1977[56] | Multiple case reports (2 patients) | **5 years, and NR** | **Dextrose solution; NR (rehydration)** | **Skin grafts; debridement** | **Gangrene, disfigured, and incapacitated** |
| Nissim et al. 2008[57] | Case report | **1 day** | **NR** | **Conservative treatment** | **Interval shrinkage and dissolution of the mass** |
| Onesti et al. 2012[58] | Case report | **2 days (preterm)** | **Parenteral nutrition** | **Elevation, topical silver sulphadiazine, some debridement, acellular dermal substitute, autologous keratinocytes** | **9 months, scars and deformed foot (surgical correction); 14 months, fully healed** |
| O’Reilly et al. 1988[59] | Case report | **Neonate** | **Parenteral nutrition** | **Glyceryl trinitrate patch** | **Healed without scarring (small area not covered, skin lost)** |
| Ozcan et al. 2015[60] | Case report | **14 years** | **Adrenalin** | **Elevation, local antibiotic ointment and pentoxyphilline** | **Patient died due to septic shock** |
| Pantelides et al. 2013[61] | Case report | **1 day (preterm)** | **Dextrose solution (12.5%)** | **Elevation** | **No scarring or functional deficit** |
| Park et al. 2015[62] | Case report | **7 months** | **Parenteral nutrition** | **Fasciotomy for compartment syndrome. Irrigation with saline solution. Debridement, after 4 months skin graft** | **Needed rehabilitation for contracture, healed with scar** |
| Phillips et al. 2009[63] | Case report | **3 months** | **Dopamine** | **Conservative treatment, topical antibiotics, debridement, physical therapy** | **Needed 12 months of physical therapy. May need secondary surgery** |
| Raffaella et al. 2009[64] | Case report (2 extravasations) | **5 years** | **Calcium gluconate** | **Treated conservatively (limb elevation, daily wound care, and warm compresses), antibiotics, disinfection, and physiotherapy, daily hyperbaric oxygen therapy (HOT), weekly surgical debridement and escharectomy, sodium thiosulphate for calcification** | **8 months to fully healed** |
| Ravenel 1983[65] | Case report | **6 days** | **Calcium gluconate** | **Antibiotics, nafcillin sodium** | **6 weeks, swelling subsided** |
| Reilly et al. 1977[66] | Multiple case reports (3 patients) | **13, 15 and 17 years** | **Adriamycin** | **Cold compress (1), antibiotics (1), hydrocortisone (1)** | **2 lost functional use, less serious 1 healed** |
| Reynolds 2007[67] | Case report | **2 days (preterm)** | **Intralipid and parenteral nutrition** | **Elevation** | **12 hours to heal completely** |
| Roberts 1977[68] | Multiple case reports (5 patients) | **Neonates (1 day to 1 year)** | **Calcium gluconate** | **Conservative treatment (none or warm soaks)** | **Resolved spontaneously** |
| Rosales et al. 2004[69] | Case report | **75 days (preterm)** | **Parenteral nutrition and intralipid** | **Antibiotics, drained** | **Died of sepsis** |
| Roth et al. 2006[70] | Case report | **31 days** | **Propofol and lidocaine** | **Saline, debridement, skin graft** | **Satisfactory functional healing** |
| Rustogi et al. 2005[71] | Case report | **4 days (preterm)** | **Sodium bicarbonate (NaHCO3)** | **Acticoat dressing** | **57 days to heal** |
| Salameh et al. 2004[72] | Case report | **3.5 years** | **Arginine** | **Compressive dressing, debridement, skin grafts** | **Functional result** |
| Samiee-Zafarghandy et al. 2014[73] | Case report | **1 day (preterm)** | **Packed red blood cells** | **Conservative management, topical nitroglycerin** | **Loss of two toes** |
| Sanpera et al. 1994[74] | Multiple case reports (2 patients) | **3 days and neonate (preterm)** | **Calcium solution and NR** | **Eusol Solution and debridements. dressings** | **Limb shortening and deformity** |
| Santoshi et al. 2008[75] | Case report | **Neonate (preterm) (seen at 5 years)** | **Blood, fluids and antibiotics** | **NR – claw deformity at 5 years - fibrous sheet was excised, the extensor tendons were tenolysed, and full correction was obtained** | **Some scarring but functional** |
| Schafer et al. 2005[76] | Case report | **2 weeks** | **Phenobarbital** | **Topical antibiotics, debridement and skin graft** | **Fully recovered** |
| Schie et al. 2013[77] | Case report | **33 weeks (preterm)** | **NR** | **Non-contact low-frequency ultrasound (NFLU; 19 sessions), debridement, amorphous hydrogel and covered with a thin film or hydrocolloid, silicone sheet** | **32 days, healed without complication** |
| Schumacher et al. 1987[78] | Case report | **7 years** | **Calcium disodium edetate (EDTA)** | **Warm soaks and splints** | **Calcification needed surgery (1.75 years later)** |
| Sharief et al. 1994[79] | Case report (2 extravasations) | **1 day (and 3 days)** | **Phenytoin** | **NR** | **1 week, complete resolution** |
| Shenaq et al. 1996[80] | Case report | **10 years** | **Adriamycin (doxorubicin)** | **Left for 4 months, Debridement, physical therapy, dressings, skin graft, capsulotomies** | **Not fully functional** |
| Sindal et al. 2015[81] | Case report | **Neonate (preterm)** | **NR** | **Debridement and topical antibiotic ointment** | **2 weeks, healed completely** |
| Siu et al. 2007[82] | Case report | **2 days (preterm)** | **Parenteral nutrition (dextrose, calcium, potassium, etc)** | **Hyaluronidase and saline flushes, dressings** | **Healed within 5 days** |
| Siwy et al. 1987[83] | Case report | **2 days** | **Dopamine** | **Infusion of phentolamine (Regitine) in saline solution, kept at heart level** | **Healed after 9 days** |
| Sokol et al. 1998[84] | Case report | **14 months (preterm)** | **Phenytoin** | **Hyaluronidase** | **Barely visible scar** |
| Sonohata et al. 2006[85] | Case report | **14 years** | **Phenytoin (diazepam before)** | **Hydrocortisone injections, elevation, warm packs** | **5 weeks to fully recovered** |
| Sonohata et al. 2008[86] | Case report | **3 days** | **Calcium gluconate** | **No treatment** | **5 months, fully recovered** |
| Soon et al. 2001[87] | Case report | **38 weeks** | Calcium gluconate | **Local skin care and topical antibiotic** | **3 months, recovered** |
| Spenny et al. 2004[88] | Case report | **3 years** | **Ceftriaxone sodium** | **Cold pack, diphenhydramine hydrochloride and epinephrine, clindamycin and morphine, fasciotomies** | **3 months, healed with complete function** |
| Stahl et al. 2000[89] | Case report | **10 years** | **Mannitol** | **Fasciotomies** | **1 year, no neurological or vascular damage** |
| Subedi et al. 2011[90] | Case report | **16 years** | **Dextrose** | **Analgesics and antibiotics followed by local incision and drainage. Managed conservatively for almost 5 months. Oral medications (gabapentin, amitriptyline, tramadol), a series of stellate ganglion blocks with bupivacaine, and limb physiotherapy** | **6 months, pain and swelling subsided drastically with marked functional recovery** |
| Subhani et al. 2001[91] | Case report | **1 day** | **Dopamine** | **Phentolamine** | **Within the next few hours, there was complete resolution of the discoloration** |
| Talbot et al. 2011[92] | Multiple case reports (3 patients) | **7 to 10 months** | **2 NR, 1 hydration** | **Fasciotomies for compartment syndrome, vacuum-assisted closure (2) or moist dressings (1)** | **Full functional recovery** |
| Tilden et al. 1980[93] | Multiple case reports (4 patients) | **15 days to 4 months** | **Nafcillin sodium** | **Saline dressing and sulphadiazine silver (2), debridement and skin graft (1), bacitracin ointment (1)** | **Healing well (3), , bacitacin not improved, died** |
| Tiras et al. 2005[94] | Case report | **2 days** | **Calcium gluconate** | **Debridement using collagenase clostridipeptidase A (CCA) and bacitracin ointment mixture in gauze after wetting the wound with sterile saline** | **Healed without surgery** |
| Tobin 2007[95] | Case report | **1 day (preterm)** | **Parenteral nutrition** | **Oral antibiotics, ActiFormCool dressings** | **6 weeks, the wound had healed, with scarring** |
| Tuncer et al. 2006[96] | Case report | **6 years** | **Calcium solution** | **Surgery for calcinosis (4 years later)** | **Full recovery** |
| Vanwijck and Lengele 1994 [97] | **Case Report** | **9 years** | Meglumine ioxitalamate | Lipoaspiration with saline wash, followed by liposuction, under LA (8) or GA (1). Redon’s drain kept under aspiration for 24h. perioperative and postoperative IV antibiotics, NSAIDS, elevated arm with light compress for 48h. Lymphatic drainage for persistent oedema at 1 week f-u. | Absent pulse in one child re-appeared immediately after liposuction. Moderate reduction in extension (20 degrees) of two fingers extension in one patient. No other adverse events. |
| **Von Mühlendahl 2012[98]** | **Multiple case reports (6 patients)** | **14 days (preterm) to 14 months** | **Fluids or electrolyte solution (5; 1 plus erythromycin), phenytoin (1)** | **Immediate/early stage: Within 24 hours of extravasation injury, complete removal of the aggravating substance via pressure relieving incisions and flushing with Ringer's solution or removal by aspiration (whichever is more appropriate); or**  **Later than 24 hours: Debridement and defect coverage (e.g., grafts)**  **Standard care (6), skin grafts (2)** | **Scars (3), loss of fingers due to sepsis (1), successful grafts (2)** |
| Wada et al. 2003[99] | Case report | **Neonate** | **Calcium solution** | **Conservative treatment, debridement, skin graft** | **6 years, surgery for physeal arrest and short leg; further surgeries up until 12 years; 16 years, deformity remained** |
| Wiegand et al. 2010[100] | Case report | **17 years** | **Dextrose** | **Elevation, cold compresses, hyaluronidase** | **Full recovery** |
| Wolfe et al. 1983[101] | Case report | **2 days** | **Calcium solution** | **Antibiotics, immobilisation, and dressings** | **6 months, full recovery** |
| Wong et al. 1992[102] | Multiple case reports (2 patients) | **4 and 15 days (both preterm)** | **Dopamine** | **Nitroglycerin ointment, phentolamine (1), elevation (1)** | **24 hours, full recovery** |
| Wong et al. 2015[103] | Case report | **4 days** | **Calcium gluconate** | **Managed conservatively** | **20 weeks, healed** |
| Yamamoto et al. 1994[104] | Multiple case reports (2 patients) | **1 and 4 years** | **Dopamine and tromethamine** | **Debridement and skin grafts (2), scar surgery (1)** | **Functional recovery** |
| Yosowitz et al. 1975[105] | Multiple case reports (7 patients) | **2 days to 10 years (2 preterm)** | **Dextrose (10%) or calcium solutions** | **Debridement (7) and skin grafts (4)** | **3 functional, 1 NR, 2 healed, 1 leg amputated** |
| Zenk et al. 1981[106] | Multiple case reports (3 patients) | **3 days to 4 months** | **Nafcillin sodium** | **Hyaluronidase (2); warm compresses and elevation, and 2 months skin graft (1)** | **3 healed (2 given hyaluronidase healed within a day)** |

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