GLUBRAN®2

ENDOVASCULAR

SOLVES.

Building the perfect Embolization

GEM SOLUTION COMES FROM EVOLUTION.

WHY GLUBRAN® 2

Great penetration capacity also suitable for distal and very peripheral targets [68,71,77,79,81,82]

Effective and quick [1,20,38,48,57]

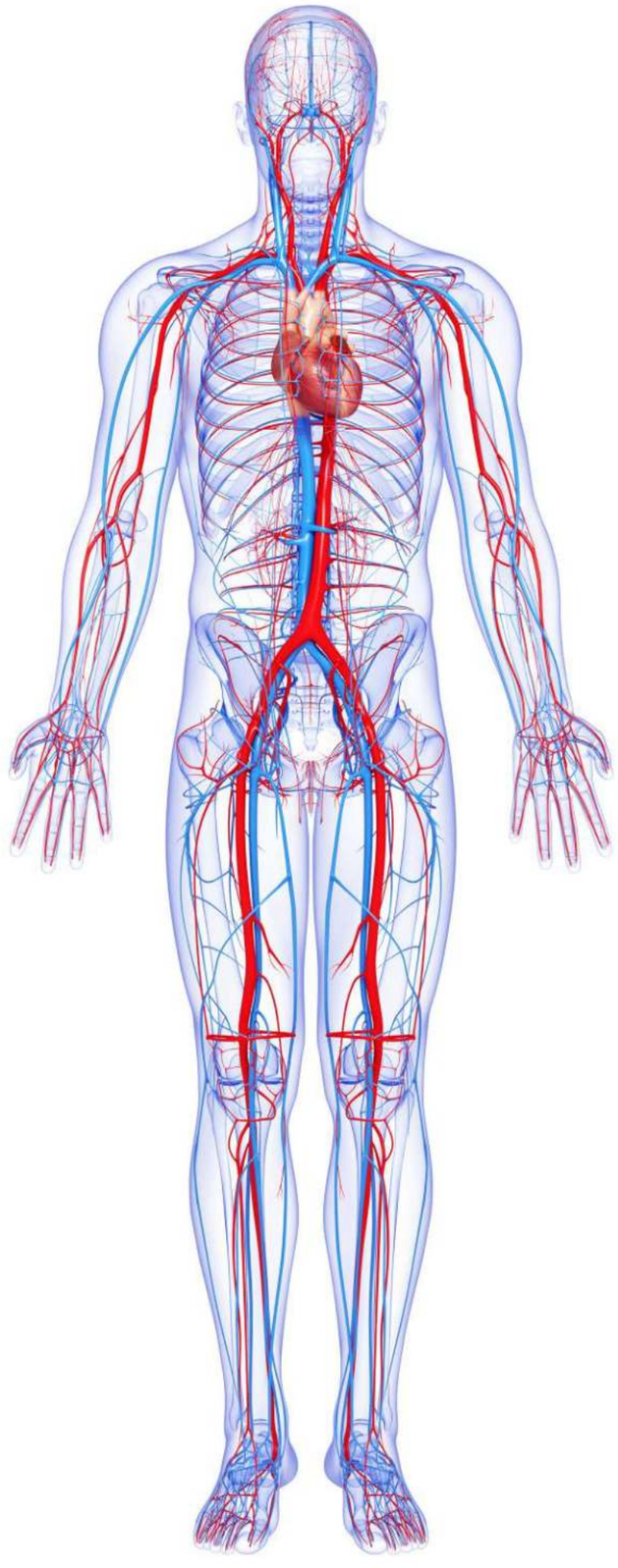
Easy to prepare [8,20,23,31,48]

Suitable for emergencies [38,57,58]

High haemostatic power [3,7,8,48,57,76]

Applicable with standard 4F catheters [27,40]

In addiction to mechanically embolizing it also acts as a sclerotizing agent [27,13,17,27]



It does not cause pain [20,27,85]

It does not contain toxic solvents [86]

Can be used in combination with other embolizing agents (Spirals and Microspheres) [38,48,75,79]

Reduced costs: "This treatment is safe, effective and a "low cost" treatment with a high success rate" [1,20]

Effective even in patients on anticoagulants or affected by inherited coagulation disorders [28,31,48]

It generates a permanent occlusion [31,40,85]

CE authorized for endovascular use [1,27]

SIX PRODUCTS IN A DROP.

ADHESIVE

High tensile strength. Acceptable minimum load is ≥ 435 N [approx. 18 Kgf/cm^2].[2-3]

SEALANT

Applied with dedicated nebulizing devices it forms a thin film with sealing and waterproof properties due to its synthetic nature and strong adhesive power.[3-6]

HAEMOSTATIC

Effective in wet environment.[10]

BACTERIOSTATIC

Blocks bacterial growth for an average of 7 days.[10-12]

SCLEROSANT

Injected into the lumen of a vessel/varices, polymerize generating a plastic cap causing thrombosis and subsequent fibrosis and sclerosis.[13-17]

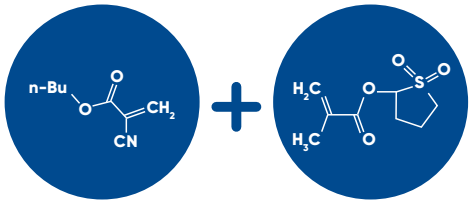
LIQUID EMBOLIZING AGENT [20-81]

Injected into a blood vessel polymerizes building a cast adhers to the vessel occluding it such as an embolus. It causes completely and definitively occlusion without any recanalization, equivalent to surgical ligation.

Tailored dilutions with Lipiodol allow a great modulability of Glubran®2, adaptable to a large variety of cases:

TREATMENTS	GLUBRAN®2/LIPIODOL
• Arterial and venous bleeding	1:3-1:6[48,57,58, 84]
• AVM	1:3[84]
• Fistulas	1:1-1:3[24,30,36,46,62,73,79]
• Varicocele	1:1[84]
• Cysts and tumours	1:1-1:6[29,31,67]
• Portal Vein	1:1-1:8[84]
• Endoleaks tipo II	1:3[41,49,56]

- **Ready to use**
- **Does NOT polymerise in the presence of air**
- **Storage at +2 to +8°C**
- **Can remain at room T (22,5 +/- 2,5°C) per 48h** [2]



NBCA MS

The co-monomer NBCA + MS is an add value to give:

- Polymerisation Temperature: 45°C lower than 80-90 °C typycal of pure monomeric cyanoacrylates like N-Butyl-CyanoAcrylate and Hesyl-Cyanaoacrylate[10-13-61-82]
- NO tissue necrosis[10-12-61-63-64]
- Greater elasticity of the cast at the end of the polymerization[4-6]

Appearance	Odour	Density
TRANSPARENT	TYPICAL OF CYANOACRYLATES	SIMILAR TO WATER

INTERVENTIONAL RADIOLOGY
PRE → POST EMBOLIZATION

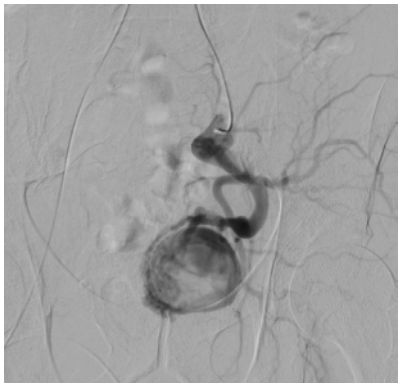
BODY [20-58]

ARTERIAL EMBOLIZATION FOR BONE TUMOURS [31]

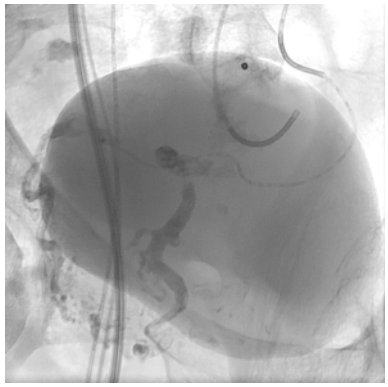
Pre-embolization

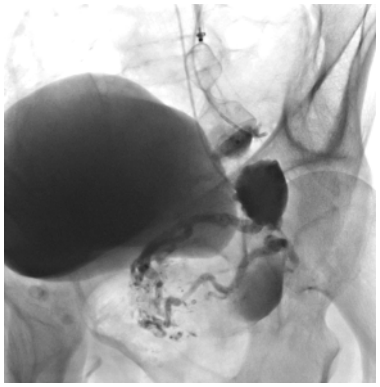
Post-embolization

PELVIC AVM [83]



Pre-embolization





Post-embolization

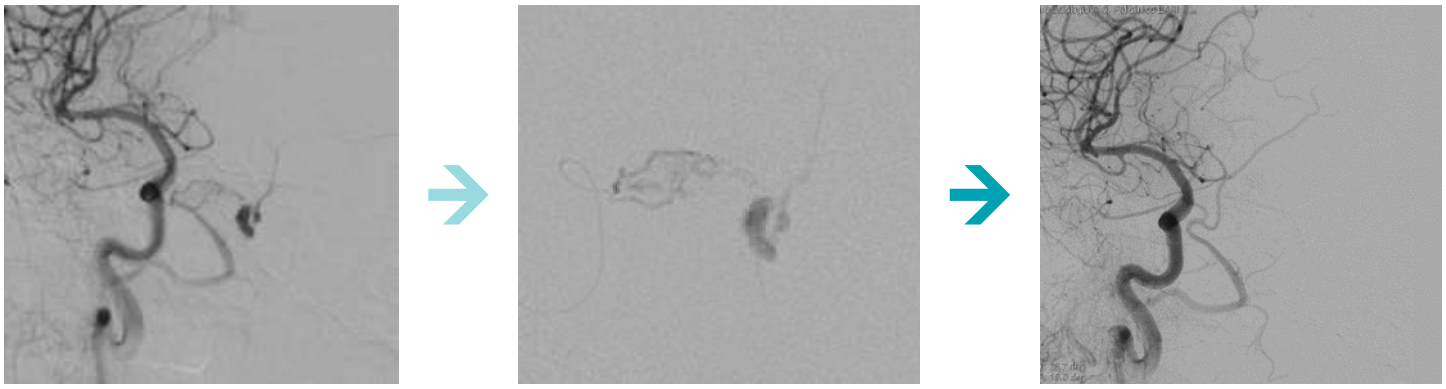
VARICOCELE [83]

Pre-embolization

Post-embolization

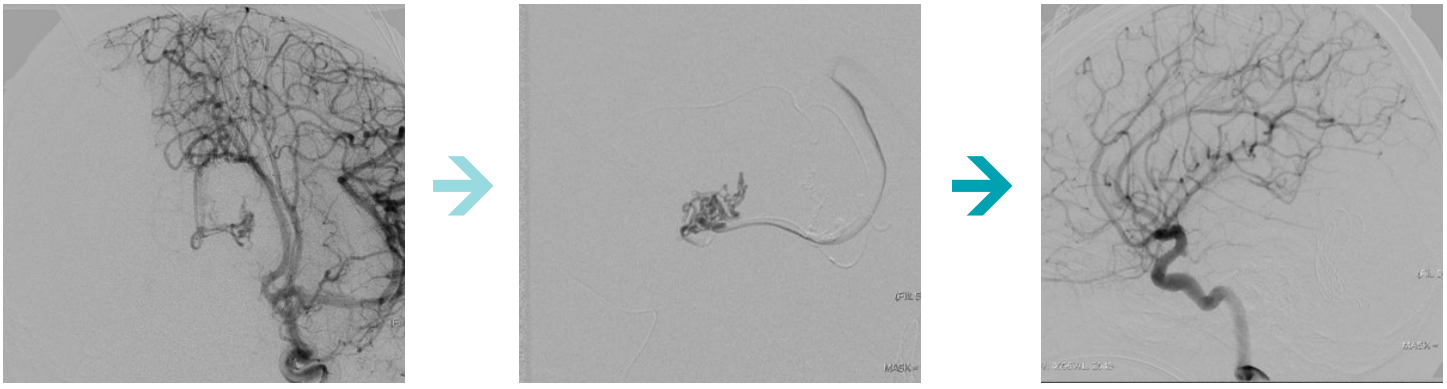
HEAD & NECK [59-81]

DURAL FISTULA [62]



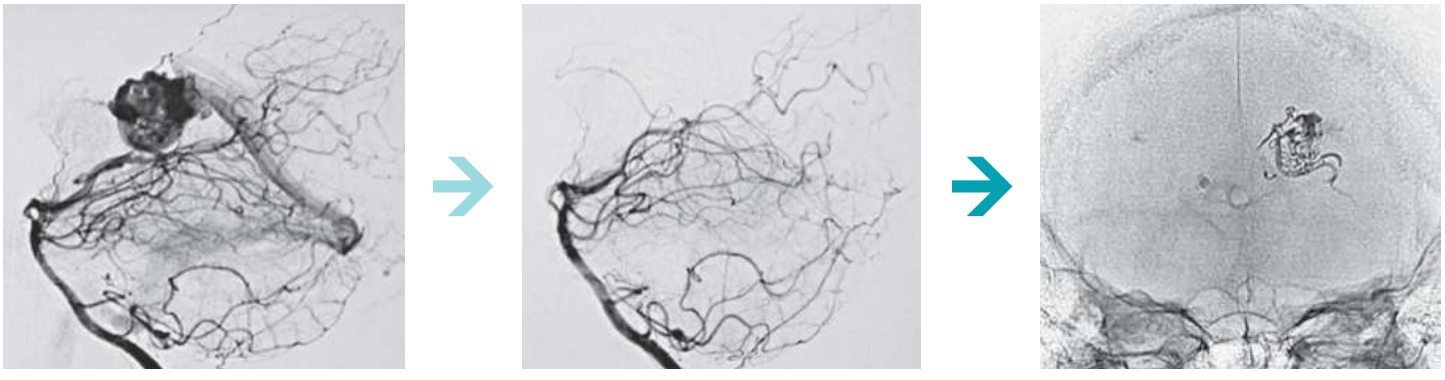
Pre-embolization | Microcatheterization | **Post-embolization**

INTRAVENTRICULAR BLEEDING [62]



Pre-embolization | Microcatheterization | **Post-embolization**

AVM HEMORRHAGE IN A YOUNG PATIENT [62]



AVM bleeding | After Glubran®2 injection the AVM was completely obliterated. | **Post-embolization**

GUIDELINES FOR USING GLUBRAN®2

1. Careful preliminary angiographic examination

Identification of the afferent and collateral vessels and any eventual AV fistulas, with oblique and cranio-caudal projections

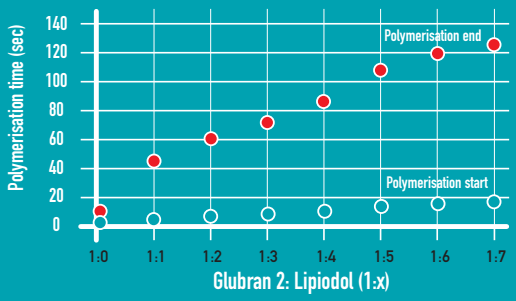
2. Selective and superselective catheterisation of the area to be embolised

3. Careful hemodynamic evaluation

4. Dilute with Lipiodol®:

a) To delay the Glubran®2 to polymerisation start time

b) To make it radiopaque



5. Mix the two compounds uniformly

Immediately before injection (with a 3-way resistant stopcock or in a steel bowl)

6. Wash the catheter with glucose or dextrose solution

7. Inject slowly

- Microbolus of 0.1-0.3 ml of mixture > push with glucose/dextrose ("sandwich" technique)
- A single injection continuously

8. Remove the catheter

(quickly and immediately after the injection, if it was not performed the "sandwich technique" with glucose)

9. Eventual check with contrast medium at least two minutes later

WARNING: DO NOT USE GLUBRAN® 2 WITH POLYCARBONATE OR SILICONE MATERIALS

Advised products & materials

- Glubran® 2/Lipiodol® Ultra-Fluid
- Glucose or dextrose 5%-33%
- Polyethylene (PE) or polypropylene (PP) syringes with luer lock
- 3-way-stopcocks
- Standard 4F catheter
- Coaxial microcatheter

Glubran® 2/Lipiodol® dilution ratios[84]

	MICROCATHETER POSITION	CATHETER TIP	INJECTION OF THE MIXTURE	FLOW SPEED	OCCLUSION	EXAMPLES OF APPLICATIONS
GLUBRAN® 2/LIPIODOL®[84] Dilution ratio 1:1 to 1:3[1-9]	Close to lesion	Wedged	Continuous	High	Proximal	Varicocele, Hypervascularized tumors,Gastro-intestinal bleedings, Peripheral bleedings, Pseudoaneurysms, High-flow AVM
GLUBRAN® 2/LIPIODOL®[84] Dilution ratio 1:4 to 1:9[10-14]	Far from lesion	Free	Drop by drop	Low	Distal	Organ-end artery, Portal vein embolization, Low-flow AVM, Tumor devascularization, Venous malformations, Lymphatic leakage

Bibliography

1. Loffroy R. Glubran2, Histoacryl or Trufill: Which cyanoacrylate glue for endovascular use? Diagn Interv Imaging. 2016 Jan;97 (1):119.
2. Soldani G. Valutazione della Biocompatibilità del Dispositivo Medico Chirurgico di Classe III: Glubran 2. Laboratory for Biomaterials & Graft Technology -Istituto di Fisiologia Clinica Del CNR Creas- Malattie Cardiovascolari e Discipline Affini; MASSA, Italy. 1998. Internal GEM data file.
3. Kull S, Martinelli I, Briganti E, Losi P, Spiller D, Tonlorenzi S, Soldani G. Glubran2 surgical glue: in vitro evaluation of adhesive and mechanical properties. J Surg Res. 2009 Nov;157(1):e15-21
4. Davoli F, Sellitri F, Brandolini J, Dolci G, Castagnoli A, Bedetti B, Stella F. Use of coagulant spray glue (Glubran 2) for aerostatic purposes in pulmonary parenchyma resections in pigs: a preliminary study. Eur Surg Res. 2009;43(4):360-4.
5. Esposito C (1997) L'utilisation d'une nouvelle colle chirurgicale en chirurgie laparoscopique: quels avantages? J Coeliochir 23: 66–68
6. Paral J, Lochman P, Blazej S, Pavlik M. Glued versus stapled anastomosis of the colon: an experimental study to determine comparative resistance to intraluminal pressure. Asian J Surg. 2014 Jul;37(3):154-61.
7. Esposito C, Damiano R, Settimi A, De Marco M, Maglio P, Centonze A. Experience with the use of tissue adhesives in pediatric endoscopic surgery. Surg Endosc. 2004 Feb;18(2):290-2. Epub 2003 Dec 29. Review
8. Cipolletta L, Zambelli A, Bianco MA, De Grazia F, Meucci C, Lupinacci G, Salerno R, Piscopo R, Marmo R, Orsini L, Rotondano G. Acrylate glue injection for acutely bleeding oesophageal varices: A prospective cohort study. Dig Liver Dis. 2009 Oct;41(10):729-34.
9. Grassia R, Capone P, Iiritano E, Vjero K, Cereatti F, Martinotti M, Rozzi G, Buffoli F. Non-variceal upper gastrointestinal bleeding: Rescue treatment with a modified cyanoacrylate. World J Gastroenterol. 2016 Dec 28;22(48):10609-10616.
10. Losi P, Burchielli S, Spiller D, Finotti V, Kull S, Briganti E, Soldani G. Cyanoacrylate surgical glue as an alternative to suture threads for meshfixation in hernia repair. J Surg Res. 2010 Oct;163(2):e53-8
11. Karatepe O, Ozturk A, Koculu S, Cagatay A, Kamali G, Aksoy M. To what extentis cyanoacrylate useful to prevent early wound infections in hernia surgery? Hernia. 2008 Dec;12(6):603-7.
12. Howell JM, Bresnahan KA, Stair TO, Dhindsa HS, Edwards BA (1995) Comparison of effects of suture and cyanoacrylate tissue adhesive on bacterial counts in contaminated lacerations. Antimicrob Agents Chemother 39:559–560
13. Montanaro L, Arciola CR, Cenni E, Ciapetti G, Savioli F, Filippini F, Barsanti LA. Cytotoxicity, blood compatibility and antimicrobial activity of two cyanoacrylate glues for surgical use. Biomaterials. 2001 Jan;22(1):59-66
14. Sáenz de Miera Rodríguez A, Baltar Arias R, Vázquez Rodríguez S, Díaz Saa W, Ulla Rocha JL, Vázquez-Sanluis J, Vázquez Astray E. N-Butyl-2-cyanoacrylate plug on fundal varix: persistence 3 years after sclerosis. Rev Esp Enferm Dig. 2009 Mar;101(3):212-4.
15. Seewald S, Sriram PV, Naga M, Fennerty MB, Boyer J, Oberti F, Soehendra N. Cyanoacrylate glue in gastric variceal bleeding. Endoscopy. 2002 Nov;34(11):926-32.
16. Seewald S, Seitz U, Yang AM, Soehendra N. Variceal bleeding and portal hypertension: still a therapeutic challenge? Endoscopy. 2001 Feb;33(2):126-39.
17. Battaglia G, Bocus P, Merigliano S, Morbin T, Carta A, Coppa F, Rampado S, Ancona E. Les aspects endoscopiques de l'hypertension portale: diagnostic et classification. Acta Endoscopica. 2000 Dec;30(5):537-554
18. Seewald S, Ponnudurai R, Jackle S, Thonke F, Soehendra N. Traitment endoscopique de l'hemorragie par rupture de varices. Acta Endoscopica. 2000 Dec; 30(5):511-517.
19. Battaglia G, Morbin T, Patarnello E, Carta A, Coppa F, Ancona A. Diagnostic et traitement endoscopique des varices gastriques. Acta Endoscopica. 1999 Apr; 29(2):97-114.
20. Favard N., Moulin M., Fauque P., Bertaut A., Favelier S., Estivalet L., Michel F., Cormier L., Sagot P., Loffroy R. Comparison of three different embolic materials for varicocele embolization: retrospective study of tolerance, radiation and recurrence rate. Quant Imaging Med Surg. 2015 Dec;5(6):806-14.
21. Poretti D. Trattamento delle fistole enteriche post-chirurgiche con iniezione imaging-guidata di colla a base di cianoacrilato modificato. Extract from "Proceedings XXXVIII Congresso Sico 2015" CIC Edizioni Internazionali, pag.11-14.
22. Loffroy R. Using Glubran 2 acrylic glue to maximize results of transcatheter arterial embolization for refractory upper gastrointestinal bleeding. Scand J Gastroenterol. 2015;50(10):1306-7.
23. San Norberto EM, Brizuela JA, Revilla Á, Taylor JH, Vaquero C. Endovascular embolization of a muscular symptomatic arteriovenous malformation with Glubran 2 acrylic glue. Vascular. 2015 Aug;23(4):432-5.
24. López J, Rodriguez K, Targarona EM, Guzman H, Corral I, Gameros R, Reyes A. Systematic review of cyanoacrylate embolization for refractory gastrointestinal fistulae: a promising therapy. Surg Innov. 2015 Feb;22(1):88-96.
25. Rebonato A, Auci A, Sanguinetti F, Maiettini D, Rossi M, Brunese L, Carrafiello G, Torri T. Embolization of the periprostatic venous plexus for erectile dysfunction resulting from venous leakage. J Vasc Interv Radiol. 2014 Jun;25(6):866-72.
26. Marcello R, Marcello G. Glubran 2 Transcatheter Embolization of Active Gastrointestinal Hemorrhage. International symposium on endovascular therapy; 2014, January 18-22.
27. Urbano J, Cabrera M, Alonso-Burgos A. Sclerosis and varicocele embolization with N-butyl cyanoacrylate: experience in 41 patients. Acta Radiol. 2014 Mar;55(2):179-85.
28. Del Corso A, Vergaro G. Percutaneous treatment of iatrogenic pseudoaneurysms by cyanoacrylate-based wall-gluing. Cardiovasc Intervent Radiol. 2013Jun;36(3):669-75.
29. Rossi G, Mavrogenis AF, Casadei R, Bianchi G, Romagnoli C, Rimondi E, RuggieriP. Embolisation of bone metastases from renal cancer. Radiol Med. 2013 Mar;118(2):291-302.
30. Mauri G, Sconfienza LM, Fiore B, Brambilla G, Pedicini V, Poretti D, Lutman RF, Montorsi M, Sardanelli F. Post-surgical enteric fistula treatment with image-guided percutaneous injection of cyanoacrylic glue. Clin Radiol. 2013 Jan;68(1):59-63.
31. Rossi G, Mavrogenis AF, Rimondi E, Ciccarese F, Tranfaglia C, Angelelli B,Fiorentini G, Bartalena T, Errani C, Ruggieri P, Mercuri M. Selective arterial embolisation for bone tumours: experience of 454 cases. Radiol Med. 2011 Aug;116(5):793-808.
32. Rossi G, Angelini A, Mavrogenis AF, Rimondi E, Ruggieri P. Successful treatment of aneurysmal bone cyst of the hip in a child by selective transcatheter arterial embolization. J Vasc Interv Radiol. 2010 Oct;21(10):1591-5.
33. Chandra J, Anthony S, Uberoi R. Embolization of the internal iliac artery with glubran 2 acrylic glue: initial experience with an adjunctive outflow occlusive agent. J Vasc Interv Radiol. 2010 Jul;21(7):1109-14.
34. Rossi G, Rimondi E, Bartalena T, Gerardi A, Alberghini M, Staals EL, Errani C,Bianchi G, Toscano A, Mercuri M, Vanel D. Selective arterial embolization of 36 aneurysmal bone cysts of the skeleton with N-2-butyl cyanoacrylate. Skeletal Radiol. 2010 Feb;39(2):161-7.
35. Loffroy R, Guiu B. Role of transcatheter arterial embolization for massive bleeding from gastroduodenal ulcers. World J Gastroenterol. 2009 Dec 21;15(47):5889-97.
36. Pedicini V. Treatment of postoperative enteric fistulas through percutaneous image-guided injection of Glubran 2. XXVIII SPIGC National Congress | Varese, 22-24 March 2017
37. Urbano J, Cabrera M, Alonso A. Usage and applicability of Cyanoacrilate monomer: further vascular malformations. e-Poster: P-157 Congress: CIRSE 2009
38. Loffroy R, Guiu B, D'Athis P, Mezzetta L, Gagnaire A, Jouve JL, Ortega-Deballon P, Cheynel N, Cercueil JP, Krausé D. Arterial embolotherapy for endoscopically unmanageable acute gastroduodenal hemorrhage: predictors of early rebleeding. Clin Gastroenterol Hepatol. 2009 May;7(5):515-23.
39. Lauterio A, Slim A, Aseni P, Giacomoni A, Di Sandro S, Corso R, Mangoni I, Mihaylov P, Al Kofahi M, Pirotta V, De Carlis L. Percutaneous Transhepatic Bile Duct Ablation with n-Butyl Cyanoacrylate in the Treatment of a Biliary Complication after Split Liver Transplantation. J Transplant. 2009;2009:824803
40. Gandini R, Angelopoulos G, Konda D, Messina M, Chiocchi M, Perretta T, Simonetti G. Transcatheter embolization of a large symptomatic pelvic arteriovenous malformation with Glubran 2 acrylic glue. Cardiovasc Intervent Radiol. 2008 Sep-Oct;31(5):1030-3.
41. Gorlitzer M, Mertikian G, Trnka H, Froeschl A, Meinhart J, Weiss G, Grabenwoeger M, Rand T. Translumbar treatment of type II endoleaks after endovascular repair of abdominal aortic aneurysm. Interact Cardiovasc Thorac Surg. 2008 Oct;7(5):781-4.
42. Keeling AN, Costello R, Lee MJ. Rasmussen's aneurysm: a forgotten entity? Cardiovasc Intervent Radiol. 2008 Jan-Feb;31(1):196-200.
43. Heye S, Maleux G, Wilms G. Pain experience during internal spermatic vein embolization for varicocele: comparison of two cyanoacrylate glues. Eur Radiol. 2006 Jan;16(1):132-6.
44. Gandini R, Spinelli A, Konda D, Reale CA, Fabiano S, Pipitone V, Simonetti G. Superselective embolization in posttraumatic priapism with Glubran 2 acrylic glue. Cardiovasc Intervent Radiol. 2004 Sep-Oct;27(5):544-8.
45. Schoder M, Cartes-Zumelzu F, Grabenwöger M, Cejna M, Funovics M, Krenn CG, Hutschala D, Wolf F, Thurnher S, Kretschmer G, Lammer J. Elective endovascular stent-graft repair of atherosclerotic thoracic aortic aneurysms: clinical results and midterm follow-up. AJR Am J Roentgenol. 2003 Mar;180(3):709-15.
46. Mauri G, Pescatori LC, Mattiuz C, Poretti D, Pedicini V, Melchiorre F, Rossi U, Solbiati L, Sconfienza LM. Non-healing post-surgical fistulae: treatment with image-guided percutaneous injection of cyanoacrylic glue. Radiol Med. 2017 Feb;122(2):88-94
47. Andronic O., Alexa O., Veliceasa B.. Outocome of internal Hemipelvectomy in a patient with multiple myeloma - case report Rev. Med.Chir2016 vol 120.
48. Abdulmalak G, Chevallier O, Falvo N, Di Marco L, Bertaut A, Moulin B, Abi-Khalil C, Gehin S, Charles PE, Latournerie M, Midulla M, Loffroy R. Safety and efficacy of transcatheter embolization with Glubran()2 cyanoacrylate glue for acute arterial bleeding: a single-center experience with 104 patients. Abdom Radiol (NY). 2018 Mar;43(3):723-733.
49. Gandini R., Chiocchi M., Morsetti D., Chiaravallotti A., Loreni G., Simonetti G.. Transcaval eandoleak embolization (TCEE) of type I and II endoleaks occuring after endovascular abdominal aortie aneurysm repair (EVAR) CIRSE 2013.
50. Saiz-Mendiguren R, Samuel-Espin RS, Llopis-Pardo M. Transiliac biposy of a deep pelvic mass with ulterior embolization of the biopsy path Saiz-Mendiguren. Intervencionismo. 2016;16(4):30-3
51. Berthod PE, Chevallier O, Latournerie M, Gehin S, Falvo N, Midulla M, Loffroy R. Atypical use of ALN inferior vena cava filters as protection devices prior to embolization of a large portosystemic shunt with Amplatzer Vascular Plugs and Glubran 2 cyanoacrylate glue. Quant Imaging Med Surg. 2018 May;8(4):452-456.
52. Sungmin Woo, Chang Jin Yoon, Jin Wook Chung, Sung-Gwon Kang, Hwan Jun Jae, Hyo-Cheol Kim, Nak Jong Seong, Young-Joo Kim, Young-Nam Woo, Control Hemoptysis: Comparison of N-Butyl-2-Cyanoacrylate and Polyvinyl Alcohol Particles Radiology: Volume 269: Number 2—November 2013
53. Del Corso A, Bargellini I, Cicorelli A, Perrone O, Leo M, Lunardi A, Alberti A, Tomei F, Cioni R, Ferrari M, Bartolozzi C. Efficacy and safety of a novel vascular closure device (Glubran 2 seal) after diagnostic and interventional angiography in patients with peripheral arterial occlusive disease. Cardiovasc Intervent Radiol. 2013 Apr;36(2):371-6.
54. Emiel B, J. Sturm, and Luc Defreyne, Acute Non variceal Gastrointestinal Hemorrhage April 2010 I Endovascular Today.
55. Gajewska K, Herinckx A, Holoye A, D'Haene N, Massez A, Cassart M, Van Rysselberge M, Donner C. Antenatal embolization of a large chorioangioma by percutaneous Glubran 2 injection. Ultrasound Obstet Gynecol. 2010 Dec;36(6):773-5.
56. Loffroy R, Kretz B, Guiu B, Bouchot O, Cercueil JP, Brenot R, Krausé D., Steinmetz E. Embolisation percutanée transabdominale d'une endofuite de type 2B sur stent-graft aortique abdominal J Radiol 2010;91:901-4.
57. Loffroy R.. Embolization for Upper GI Bleeding VOL. 15, NO. 4 APRIL 2016 Endovascular Today.
58. Lee HH, Park JM, Chun HJ, Oh JS, Ahn HJ, Choi MG. Transcatheter arterial embolization for endoscopically unmanageable non-variceal upper gastrointestinal bleeding. Scand J Gastroenterol. 2015 Jul;50(7):809-15. doi: 10.3109/00365521.2014.990503. Epub 2015 Mar 2.
59. Cotroneo E, Gigli R, Casasco A. Fistole artero-venose midollari giganti con drenaggio venoso perimidollare. Trattamento endovascolare. Rivista di Neuroradiologia 16 (Suppl. 1): 150-152 2003.
60. Niimi Y., Berenstein A., Setton A. Complications and their management during NBCA embolization of craniospinal Lesions. Interventional Neuroradiology 9 (Supp11): 157-164,2003
61. Levrier O., Mekkaoui C., Rolland PH, Murphy K, Cabrol P, Moulin G, Bartoli JM, Raybaud C. Efficacy and low vascular toxicity of embolization with radical versus anionic polymerization of n-butyl-2-cyanoacrylate (NBCA). An experimental study in the swine. J Neuroradiol. 2003 Mar;30(2):95-102.
62. Roberto De Blasi. Glubran 2 nel trattamento di MAV cerebrali non-emorragiche ed emorragiche. Edizione GEM 2016.
63. Leonardi M., Barbara C., Simonetti L., Giardino R., Nicoli Aldini N., Fini M., Martini L., Masetti L., Joechler M., Roncaroli F.. Glubran 2: A New Acrylic Glue for Neuroradiological Endovascular Use Experimental Study on Animals Interventional Neuroradiology 8: 245-250, 2002
64. Leonardi M, Cenni P, Simonetti L, Bozzao A, Romano A, Bonamini M, Fantozzi LM, Fini G. Glubran 2((r)):a new acrylic glue for neuroradiological endovascular use: a complementary histological study. Interv Neuroradiol. 2003 Sep 30;9(3):249-54. Epub 2004 Oct 22.
65. Perini S., Castellan L., Causin F. Malformazioni artero-venose cerebrali: neuroradiologia terapeutica Neurol. Sci. (2002) 23: S273-S275
66. Cotroneo E., Gigli R., Casasco A.. L'embolizzazione per via arteriosa e venosa delle fistole artero-venose intracraniche Rivista di Neuroradiologia 2003; 16 (suppl. 1): 39-42
67. Raffi L, Simonetti L, Cenni P, Bandiera S, Gasbarrini A, Boriani S, Leonardi M. Presurgical embolization of spinal tumours using glubran 2 acrylic glue. Interv Neuroradiol. 2003 Dec 20;9(4):339-49. Epub 2004 Oct 22.
68. Abud DG, Mounayer C, Benndorf G, Piotin M, Spelle L, Moret J. Intratumoral injection of cyanoacrylate glue in head and neck paragangliomas. AJNR Am J Neuroradiol. 2004 Oct;25(9):1457-62. L.
69. Simonetti L., Raffi, P., Cenni A., Andreoli F., Calducci M., Leopardi M.. Presurgical embolization of intracranial extra-axial tumors using Glubran 2: our experience in 14 patients. Rivista di Neuroradiologia 2004; 17: 645-658
70. Barbara C., Pozzati E., Marcucci G., Joechler M., Pisoni L., Bellei E., Leopardi M., Masetti L.. Effects of Glubran 2 acrylic glue on the subaracnoid surface in swine preliminary findings. Rivista di Neuroradiologia 2005; 18: 537-545.
71. Desal HA, Toulgoat F, Raoul S, Guillon B, Al Hammad Ibrahim R, Auffray-Calvier E, De Kersaint-Gilly A. Brain arteriovenous malformations technical note of endovascular treatment with Glubran. Interv Neuroradiol. 2005 Oct 5;11(Suppl 1):125-30.
72. Raffi L., Simonetti L., Cenni P., Leonardi M.. Use of Glubran 2 acrylic glue in interventional neuroradiology. Neuroradiology (2007) 49:829-836
73. Chapot R, Saint-Maurice JP, Narata AP, Rogopoulos A, Moreau JJ, Houdart E, Maubon A. Transcranial puncture through the parietal and mastoid foramina for the treatment of dural fistulas. Report of four cases. J Neurosurg. 2007 May;106(5):912-5.
74. J.Klisch, C. Eger, V. Sychra, C. Strasilla, S.Basche, J.Weber. Stent-Assisted Coil Embolization of Posterior Circulation Aneurysms Using Solitaire Ab: Preliminary Experience Neurosurgery: August 2009 - Volume 65 - Issue 2 - p 258-266
75. Wang Y, Zhang H, Ling F. Coexistence of a single cerebral arteriovenous malformation and spinal arteriovenous malformation. Neurol India. 2009Nov-Dec;57(6):785-8.
76. Rossitti S.. Spontaneous Intracerebral and Intraventricular Hemorrhage. Clin Neuroradiol (2010); 20: 131-134.
77. Guedin P., Gaillard S., Boulin A., Condette-Auliac S., Bourdain F., Guieu S., Dupuy M., Rodesch G.. Therapeutic management of intracranial dural arteriovenous shunts with leptomeningeal venous drainage: report of 53 consecutive patients with emphasis on transarterial embolization with acrylic glue. J Neurosurg. 2010, 112, 603-610.
78. Abdel Kerim A, Bonneville F, Jean B, Cornu P, LeJean L, Chiras J. Balloon-assisted embolization of skull base meningioma with liquid embolic agent. J Neurosurg. 2010 Jan;112(1):70-2.
79. Zheng-Ran Li, Zai-Bo Jiang, Ming-Sheng Huang, Kang-Shun Zhu, Qing Wang, Hong Shan. Transvenous embolization of cavernous sinus dural arteriovenous fistulas using detachable coils and Glubran 2 acrylic glue via the inferior petrosal sinus approach. Eur Radiol (2010) 20: 2939–2947
80. Q. Luo, H. Wang, K. Xu, J. Yu. Endovascular Treatments for Distal Posterior Cerebral Artery Aneurysms. Turkish Neurosurgery 2012, Vol: 22, 141-147.
81. Liu J, Lv M, Lv X, He H, Liu A, Qian Z, Li Y. Curative Glubran 2 embolization of cerebral arteriovenous malformations patient selection and initial results. Interv Neuroradiol. 2014 Dec;20(6):722-8.
82. Li YJ, Barthès-Biesel D, Salsac AV. Polymerization kinetics of n-butyl cyanoacrylate glues used for vascular embolization. J Mech Behav Biomed Mater. 2017 May;69:307-317.
83. Pictures kindly provided by Poretti D., Pedicini V,. Lanza E. Interventional Radiology Center of the Clincal Institute Humanitas- Rozzano (MI) - Italy
84. Modified by the leaflet "Lipiodol and cyanoacrylate-based glue (Glubran2/NBCA) mixing process". July 2019 Ed. Guerbet

Via dei Campi 2 - PO Box 427 - 55049 Viareggio (LU) Italy
Tel. +39 0584 389784/391388 - Fax +39 0584 397904
www.gemitaly.it - info@gemitaly.it

michbold
Rev. 02-Ed. 14/05/2020