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Safety and Efficacy Of amber Peripheral liquid embolic system: a First-in-Human & Pivotal Study. Stage I. OPAL Study

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Abstract

Purpose

To evaluate the safety and efficacy of a novel non-adhesive liquid embolic agent (Amber 20) for peripheral vascular embolization in a prospective, multicentre, first-in-human study.

Materials and Methods

This was a prospective, single-arm, multicentre, open-label first-in-human Stage I trial conducted across eleven centres in Spain. Fifteen patients requiring peripheral embolization for various indications (including hemorrhage, aneurysm/pseudoaneurysm, endoleak, portal vein embolization, and hypervascular tumors) were enrolled. The primary endpoint was the rate of device-related serious adverse events (SAEs) within 24 hours. Secondary endpoints included overall adverse events (AEs) and technical success, defined as complete vascular occlusion or devascularization on final angiography.

Results

Fifteen patients (60% female; median age 56 years) underwent embolization using Amber 20. Technical success was achieved in 100% of cases (15/15). No device-related SAEs or AEs were reported within 24 hours. One patient (6.7%) experienced a mild adverse event (postembolization syndrome) likely related to the procedure rather than the device. All adverse events resolved without sequelae. No device deficiencies were observed.

Conclusion

In this first-in-human, multicentre study, Amber 20 demonstrated a favorable safety profile and high technical success rate for peripheral vascular embolization. These preliminary findings support its potential as an effective liquid embolic agent, warranting further evaluation in larger studies with longer follow-up (Stage II).

INTRODUCTION

Transcatheter arterial and venous embolization is essential in managing various vascular conditions, including acute hemorrhage, tumors, arteriovenous malformations, venous varicosities, and endoleaks (1). Advances in imaging, catheter technology, and embolic materials,ranging from autologous clots and Gelfoam to coils, glue, and microspheres (2), have significantly increased the complexity and effectiveness of these procedures.

Embolic agents can be classified by target vessel size (3). For small vessels, available embolic devices include particles, liquid embolic agents (LEAs), and powders (4). A critical consideration is that smaller agents are associated with a higher risk of organ ischemia (4). LEAs have become a compelling strategy among smaller agents because of their versatility in several clinical indications.

LEAs can be classified into three groups according to their chemical characteristics: cyanoacrylates, ethylene vinyl alcohol copolymers, and ethiodol (5). Each type entails its advantages and disadvantages. Some

disadvantages include the need for non-ionic priming solutions with cyanoacrylates and the use of dimethyl sulfoxide (DMSO) as a solvent with ethylene vinyl alcohol copolymers. Ethylene vinyl alcohol copolymers need compatible microcatheters, lengthy preparation (shaking) and high cost (6). Additionally, LEAs can cause significant imaging artifacts, especially on computed tomography (CT) (7). A learning curve is required to handle these embolic agents effectively.

Desired improvements in the development of LEAs include minimizing all these drawbacks by reducing imaging artifacts, incorporating suitable gelation mechanisms to prevent catheter occlusion, enhancing delivery control without the risk of fragmentation, and ensuring intrinsic radiopacity to eliminate the need for pre-mixing prior to injection (5). Within this background, new LEAs have been designed and tested among these, Amber 20.

The aim of the OPAL- First in Human/Pivotal Study Stage I was to determine the safety of Amber a new organic polymer system, for peripheral complete vascular occlusion. The secondary outcome was to determine the efficacy of Amber as an organic polymer system, for peripheral complete vascular occlusion.

METHODS AND MATERIALS

Study design

A single-arm, prospective, multicentre, open-label, First-in-Human was conducted (ClinicalTrials.gov Identifier:NCT06456125). The primary objective of this study was to evaluate the safety of Amber as an organic polymer system, for peripheral complete vascular occlusion. Secondary objective was to evaluate the efficacy of Amber as an organic polymer system, for peripheral complete vascular occlusion.

Investigators at eleven centres in Spain enrolled patients from May 2024 to November 2024 under a protocol approved by their institutional ethics committees. Patients provided written informed consent prior to participation in the study, and procedures were conducted in accordance with the Declaration of Helsinki and good clinical practices. The rate of any peri-procedure serious adverse events and adverse events during the periprocedural period was assessed by an independent clinical events committee. Data was collected by the investigators using standardized web-based clinical report forms. Study sites were monitored for accuracy in database entry, and data was source-verified before database lock.

Study eligibility

Patients aged ≥ 18 and < 95 years without a history of failed prior embolization and no allergy to Amber 20, DMSO, or contrast agent who require peripheral embolization due to varicose vein, type II endoleak, insufficient liver remnant requiring portal vein embolization (PVE) before liver resection, active arterial hemorrhage, aneurysm and/or pseudoaneurysm, pathologic organ, hypervascular tumor and vascular anomalies (excluding the central nervous system and central circulatory system) were eligible for enrolment. Table 1 provides a detailed description of the inclusion and exclusion criteria according to the clinical condition.

Table 1
Inclusion and exclusion criteria

Inclusion criteria
Patients aged ≥ 18 and < 95 years
Varicose vein embolization
• Pelvic congestion syndrome: o Pelvic pain that often worsens as the day goes on and/or pain during intercourse or severe menstrual cramping and/or, o Uterine venous engorgement and/or, o Moderate or severe engorgement of the ovarian plexus and/or, o Filling of the veins across the midline or filling of vulvar or thigh varicosities and/or, o Reflux throughout the entire course of the ovarian vein
• Varicocele o Symptomatic varicocele > Grade II and/or, o Infertility or subfertility
• Varicose veins in patients with portal hypertension undergoing TIPS that require embolization
Type II endoleak
• Persistent type II endoleak and associated sac expansion > 5 mm after 6 months or 10 mm after 12 months.
Insufficient liver remnant requiring portal vein embolization (PVE) before liver resection
• Predicted insufficient liver remnant after surgery (≤ 20% in a normal liver, ≤ 30% in liver with intermediate disease without cirrhosis, and ≤ 40% in liver with cirrhosis)
Active arterial hemorrhage and/or pseudoaneurysm
• Uncontrolled massive hemorrhage caused by tumor, trauma or arteriovenous shunt formation (congenital or acquired).
• In case of bleeding or pseudoaneurysm up to 3 bleeding sites/pseudoaneurysms in the same organ or anatomic region.
Pathologic organ (excluding brain):
• Non-functioning transplanted kidney or • Preoperative hip replacement or, • Hypersplenism conditioning low platelet count or, • Polycystic kidney disease or, • Other
Hypervascular tumors
Vascular anomalies (excluding the central nervous system and central circulatory

Inclusion criteria
system).
Exclusion critera
Patients with known hypersensitivity or allergy to amber-20, DMSO solvent, or contrast agent
Individuals with significant impairment of hepatic and renal function, except for the following indications: non-functioning transplanted kidney and polycystic kidney disease in pathologic organ indication, varicose veins in patients with portal hypertension undergoing TIPS that require embolization, and portal vein embolization. The significant impairment hepatic and renal function is defined as: - Hepatic impaired function: class C Child-Pugh, and/or Bilirrubina > 3 mg/dL. - Renal impaired function: patients in stages 4 and 5 of CKD (glomerular filtration rate < 30 mL/min/1.73 m²) who are not in hemodialysis, or patients with acute renal failure.
Previously failed embolization procedure, except for those treated with coils
Patient in whom according to the investigator criteria a complete vascular occlusion would not be feasible in a single procedure
Any condition that exposes the patient to a high risk for complications according to the investigator's criteria (e.g., but not limited to, non-correctable coagulopathy, uncontrolled sepsis, underlying life-threatening condition, etc.)
Patients participating in another interventional study that has not completed its primary endpoint assessment.
Pregnant or breastfeeding women, except emergent cases with potentially life-threatening active bleeding
Recurrent varicose vein embolization
Type II endoleak with: - High flow or reflux that cannot be prevented using coils or balloon microcatheter and/or, - High risk of medullar ischemic damage
Active arterial bleeding and/or pseudo aneurysm with: - Severe hemodynamical instability (e.g., but not limited to, sustained hypotension [mean arterial pressure < 60 mmHg], tachycardia > 120 beats/minute, requirement of high doses of vasopressors, etc.) at the moment of the procedure and/or, - Hb < 8 g/dL before the procedure and/or, - In retroperitoneal hemorrhages or hemoptysis, identification of spinal or medular vessels and/or, - High risk of spinal cord ischemic damage.
Central nervous system and central circulatory system vascular anomalies.

Study device

Amber is a non-adhesive, dimethyl sulfoxide (DMSO)-based, tantalum-free embolic liquid system. This peripheral liquid embolic system offered in a single formulation that allows distal and deep injections, contains the following: 1 vial of Amber 20 (1.5 ml), 1 vial of DMSO (1.5 ml), 2 syringes for administration of Amber 20 and 1

syringe for DMSO. Figure 1. The copolymer is chemically bonded to an iodinated component, resulting in an iodinated polyacrylate that provides homogeneous radioscopic visualization. The iodine groups are covalently inserted into the polymer structure, creating a radiopaque, non-degradable and stable polymer with the desired characteristics. The inherent radiopacity conferred by the iodine allows the embolic fluid to be clearly visualized by CT images without artifact. In addition, it allows the fluid to be used directly without prior preparation.

Amber 20 is administered by slow and controlled injection. Upon contact with the aqueous environment within the vasculature, an exchange of media (DMSO-aqueous medium) takes place, and a progressive precipitation process begins, allowing it to advance distally towards the interior of the vascular lesion until the polymeric embolus is formed (Fig. 2). The liquid solidifies after approximately 4 min, and since it does not adhere, it allows the physician to continue injecting in the starting position or to change position by moving the microcatheter until the embolization is completed, with a reduced risk of blockage and entrapment of the microcatheter.

DMSO is an organic solvent used to fill the empty space of the microcatheter that will be used during the injection of Amber 20, to avoid precipitation of the product. The microcatheters to be used during the procedure must have materials compatible with DMSO.

Sample size calculation

Despite this trial was designed as a Stage I descriptive study to assess safety and efficacy a non-inferiority test for one proportion was used to address the main hypothesis, assessing whether Amber was non-inferior to the results reported in the literature, i.e., whether it achieved a technical success rate non-inferior to 98.86% (95% CI 97.11–99.56), as estimated by a meta-analysis combining data from 2,204 patients. This meta-analysis was conducted using published data from 50 similar studies. The rationale for determining an appropriate non-inferiority margin was based on the results of this meta-analysis, establishing a margin of at most 5 percentage points below the lower bound of the 95% CI for the pooled technical success rate, i.e., 97.11 − 5 = 92.1. Therefore, Amber was considered non-inferior if the technical success rate was equal to or greater than 92.1%, leading to a non-inferiority margin of Δ = 92.1 − 98.86 = − 6.76. Thus, for the primary effectiveness endpoint, the statistical hypothesis test was defined as: H_0: $\pi - \pi_0 \leq -0.676$ (inferiority) versus H_1: $\pi - \pi_0 > -0.676$ (non-inferiority),

or equivalently: H_0: $\pi \leq 0.921$ (inferiority) versus H_1: $\pi > 0.921$ (non-inferiority), where π denoted the technical success rate of Amber and π_0 the reference technical success rate estimated in the meta-analysis ($\pi_0 = 0.9886$).

The hypothesis was tested using a one-sided, one-sample Z test for proportions (normal approximation), with a Type I error rate (α) of 0.05. The inclusion of 63 patients was sufficient to achieve a statistical power of 80% to assess the non-inferiority. Assuming an attrition rate of 10%, the sample size was increased to 70 patients.

The first 15 patients were allocated to the Stage I study, and the remaining 55 patients to the Stage II study. The hypothesis was tested in the total study population (Stage I + Stage II). All calculations were performed using PASS 2023 software (v23) under a professional license.

Patient Characteristics and clinical variables

Clinical characteristics of patients were recorded, including demographic data, comorbidities, medical treatment, previous medical history, and clinical indications for embolization. Baseline imaging and laboratory data were collected prior to the procedure. Procedural data, encompassing the devices used, imaging modalities, and medications administered, were also documented. All collected variables are presented in Table 2.

Table 2
Study variables.

Baseline visit
Demographic and anthropometric measurements • Date of birth, sex • Weight (kg) and height (cm) • Blood pressure (pressure gauge, mmHg) and cardiac rate (bpm)
Previous history • Drug allergies • Known diseases • Regular treatment • Any blood derivates transfusion
Imaging of the clinical indication for embolization • Varicose vein embolization: Doppler US and/or CT • Type II endoleak: Angio CT scan of the abdominal aorta or MRI • PVE: Liver volume by CT or MRI • Hypervascular tumor: CT or MRI • Vascular anomalies: CT, MRI and/or Doppler ultrasound scan • Active arterial bleeding, aneurysm and pseudoaneurysm: CT or MRI • Pathologic organ: CT or MRI
Patient's quality of life (EQ-5D)
Laboratories • Complete blood count • Renal and hepatic profile • Coagulation parameters • Spermiogram (varicocele)*
Pregnancy test (if aplicable)
Visual Analog Scale (VAS) to evaluate pain improvement (varicose veins: varicocele and Pelvic Congestion Syndrome).
Embolization procedure visit
Procedural data • Date and hour of beginning and ending
*Not mandatory, only if available.

Baseline visit
• Type of sedation and route of access • Devices use • Medication use • Intraprocedural imaging (angiography) • Complications • Visual Analog Scale (VAS) to evaluate the pain at device injection • Mean volume of amber 20 • Number of vials of amber 20 • Mean volume of DMSO • Other embolic agent needed
Imaging • Hypervascular tumor: CT or MRI*
Laboratories, pre- and post-procedural (if available) • Complete blood count • Renal and hepatic profile • Coagulation parameters*
Post-procedural (discharge) imaging (if available)
Discharge medication
Adverse events • Any adverse event • Device-related • Access site related • Bleeding events o Any blood transfusion
*Not mandatory, only if available.

Endpoint definitions

Outcomes were assessed in terms of both safety and efficacy. The primary outcome was the 24-hour rate of peri-procedural serious adverse events (SAE) related to Amber (device-related but not procedure-related). The secondary outcome was the 24-hour rate of any peri-procedural adverse events (AE) related to the Amber (device-related but not procedure-related). Efficacy was evaluated as the rate of complete vascular occlusion or

correct devascularization of the treated lesion, as determined by angiographic assessment at the end of the procedure.

A SAE was defined as any adverse event that led to death, injury, or permanent impairment of a body structure or function. It was also considered a SAE if it resulted in a serious deterioration in the subject's health, including a life-threatening illness or injury, permanent impairment of a body structure or function, in-patient hospitalization or prolonged hospitalization, or the need for medical or surgical intervention to prevent a life-threatening condition. Additionally, events leading to fetal distress, fetal death, or congenital abnormalities or birth defects were also classified as serious adverse events.

An AE was defined as any untoward medical occurrence, unintended disease or injury, or any untoward clinical signs (including abnormal laboratory findings) in subjects, users, or other individuals, regardless of whether it was related to the investigational device.

All the clinical investigation endpoints were defined according to the Society of Interventional Radiology (SIR) and Cardiovascular and Interventional Radiological Society of Europe (CIRSE) Quality Assurance Document and Standards for Classification of Complications definitions (8).

This Stage I clinical trial will be considered successful if the rate of peri-procedural SAEs related to Amber (device-related but not procedure-related), adjudicated by an independent clinical events committee, is ≤ 20% (≤ 3 patients) within 24 hours after the index procedure.

Statistical analysis

Continuous variables were summarized using descriptive statistics including means and standard deviations if normally distributed or median with interquartile ranges for skewed distributions. Discrete variables were summarized using absolute and relative frequencies.

The total rate of peri-procedure SAEs related to Amber (device-related but not related to the procedure) at 24 hours, adjudicated by an independent clinical events committee, will be computed. The total rate of complete vascular occlusion as defined by angiography at the end of the procedure will be computed.

RESULTS

Fifteen patients were consented and enrolled in the study between March 2024 and November 2024. Baseline patient demographics and medical histories are summarized in Table 3. Nine patients (60%) were female, with a median age of 56 years (IQR 34–74 years). The most common comorbidities were renal disease (n = 7, 46.7%), cardiovascular history (n = 6, 40%) and history of cancer (n6, 40%).

Table 3
Demographics, Medical history and current health status of study patients.

Demographics	**Total (n15)**
Gender, Female n(%)	9 (60)
Age, Median (IQR)	56.0 (34.0, 74.0)
Weight (kg), Median (IQR)	68 (46–96)
Height (cm), Median (IQR)	164 (150–183)
Body Mass Index (kg/m), Median (IQR)	24.9(20.4–34.8)
Systolic Blood Pressure(mmHg), Median (IQR)	130.0 (101.0, 159.0)
Diastolic Blood Pressure (mmHg), Median (IQR)	76.0 (51.0, 99.0)
Heart Rate (Beats/min), Median (IQR)	76.0 (55.0, 113.0)
Medical history and current health status	
Cardiovascular history (yes), n (%)	6 (40)
Bleeding disorder (yes), n (%)	0(0)
Coagulopathy (yes), n (%)	1 (6.7)
Haematologic disease (yes), n (%)	1 (6.7)
Pulmonary disease (yes), n (%)	1 (6.7)
Renal disease (yes), n (%)	7 (46.7)
Gastrointestinal disease (yes), n (%	5 (33.3)
Endocrine disease (yes), n (%)	1 (6.7)
Immunological disease (yes), n (%)	0 (0)
Diabetes (yes), n (%)	3 (20.0)
Connective tissue disorder (yes), n (%)	0 (0)
Cancer (yes), n (%)	6 (40)
History of allergy/hypersensitivity (yes), n (%)	2 (13.3)
Other relevant medical conditions (yes), n (%)	9 (60)
EQ5D VAS health status, Median (Range)	85.0 (30.0, 100.0)

Embolization indications included one case of type II endoleak (6.7%) (Fig. 3), one portal vein embolization (6.7%), four cases of active arterial hemorrhage, aneurysm, or pseudoaneurysm (26.7%), three cases of pathologic organ bleeding (20%), and six hypervascular tumors (40%)(Fig. 4). The preferred access route was femoral (n = 13, 86.7%). The number of embolization sites per procedure ranged from one artery (n = 10, 71.4%) to four arteries (n = 1, 7.1%). Most procedures required two vials per patient of Amber 20 treatment (n = 12, 80%). Complete vascular occlusion or devascularization of the treated lesion, determined by angiographic

assessment at the end of the procedure, was achieved in all patients (n = 15, 100%). All embolization procedural data are summarized in Table 4.

Table 4
Embolization: procedural data

Embolization procedural data	**Total (n15)**
Procedure indication, n(%)	
• Type II endoleak	1 (6.7)
• Insufficient liver remnant requiring portal vein embolization (PVE) before liver resection	1 (6.7)
• Active arterial hemorrhage/ aneurysm and/or pseudoaneurysm	4 (26.7)
• Pathologic organ	3 (20.0)
• Hypervascular tumor	6 (40.0)
Device use, n (%)	
• 1	2 (13.3)
• 2	12 (80)
• 3	1 (6.7)
Route of access, n (%)	
• Femoral right/left or both	13 (86.7)
• Radial right/left or both	1 (6.7)
• Other	1 (6.7)
Number of embolization sites, n (%)	
• 1	10 (71.4)
• 2	2 (14.3)
• 3	1 (7.1)
• 4	1 (7.1)
• Missing	1
Pain at device injection (VAS), n (%)	
• 0	11 (78.6)
• 1	1 (7.1)
• 4	1 (7.1)
• 6	1 (7.1)
• Missing	1
Complete vascular occlusion (yes), n (%)	15 (100)
Presence of intraprocedural complications (no) n (%)	15 (100)

In the study, 14 patients (93.3%) were free from device-related SAEs. One patient (6.7%) experienced an adverse event, categorized as mild: postembolization syndrome with mild fever, which was not related to the device but likely related to the procedure, resulting in prolonged hospitalization. Of the seven total reported AEs, categorized as mild and moderated, two (28.6%) occurred within the first 24 hours after the procedure, and none were related to the device. Three AEs (42.9%) were probably related to the procedure. All AEs (n7, 100%) resolved without sequelae. No device deficiency was reported. A full description of AEs is included in Table 5.

Table 5
Adverse events

ID	time from procedure	Description	SAE	Device deficiency	Severity	Device related	Procedure related	Outcome
5	> 24h	Postembolization syndrome	Yes	No	Mild	Not related	Probable	Resolved no sequalae
5	> 24h	Scheluded hemicolectomy	No	No	Mild	Not related	Not related	Resolved no sequalae
7	< 24h	Splenic ischemia, pain in shoulder	No	No	Mild	Not related	Probable	Ongoing
9	< 24h	Possible reaction to drugs administrated during procedure	No	No	Mild	Not related	Not related	Resolved no sequalae
9	> 24h	Gastrointestinal disorder	No	No	Mild	Not related	Not related	Resolved no sequalae
9	> 24h	fever	No	No	Moderate	Not related	Probable	Resolved no sequalae
13	> 24h	Fever	No	No	Mild	Not related	Not related	Resolved no sequalae

DISCUSSION

Results from this prospective, multicenter, first-in-human, Stage I trial demonstrated that Amber is a safe and effective embolization system for peripheral vascular embolization. Complete vascular occlusion was achieved in all patients, with no device-related SAEs. The findings of this Stage I trial, support the safety profile of Amber for peripheral vascular embolization.

In this cohort, complete vascular occlusion or devascularization was achieved in all treated patients (n = 15, 100%), aligning with previously reported outcomes for other iodine-based embolic agents. For instance, Sapoval et al. (9) documented an immediate technical success rate of 98% (n = 49), defined as complete occlusion of the target vessel(s) on the final angiogram. Similarly, published analyses of liquid embolic agents consistently demonstrate very high immediate technical success rates, typically exceeding 95% (10).

Regarding safety, no device-related SAEs or AEs were observed. A single mild SAE, likely related to the procedure rather than the device, was reported: postembolization syndrome with low-grade fever, which resulted in prolonged hospitalization. Postembolization syndrome is a well-recognized clinical condition following embolization procedures, typically resulting from the inflammatory and ischemic effects of embolization on the treated tissues. Symptoms usually appear within hours to a few days post-procedure and may include fever (commonly low-grade but occasionally > 38°C), abdominal or localized pain at the embolized site, nausea, vomiting, fatigue or malaise, and anorexia (11). In comparison, Sapoval et al. reported three major device-related complications in two patients, adjudicated by an independent Critical Events Committee, all attributed to non-target embolization (9).

In our experience, the ready-to-use formulation of Amber offered a practical advantage by reducing preparation time, as it does not require the pre-injection agitation necessary with other tantalum-based copolymers. This characteristic may be particularly relevant in scenarios demanding rapid intervention, such as active arterial bleeding. In this Stage I trial, complete vascular occlusion was achieved in all patients presenting with active hemorrhage, aneurysm, or pseudoaneurysm (n = 4, 26.7%) without any SAEs related to the device. These findings suggest that Amber could represent a valuable option in urgent endovascular settings; however, the small sample size and early-phase nature of this study limit the generalizability of our results.

Its bonded iodine-based composition ensures stable radiopacity, unlike tantalum-based embolic agents, which are prone to sedimentation with time and subsequent loss of radiopacity (12). These properties of Amber may contribute to improved procedural efficiency and operator confidence.

In addition to the embolization procedure itself, a crucial aspect of peripheral embolization involves follow-up through imaging techniques, such as computed tomography. Preclinical studies conducted for Amber, suggests that it is associated with fewer CT imaging artifacts (13). The absence of CT imaging artifacts due to the lack of tantalum powder in the device is an advantage especially in cases in which CT follow-up is important, for example in the follow-up of type II endoleaks, representing a major advantage over other liquid embolic agents (Fig. 3).

This prospective, multicenter, first-in-human Stage I trial evaluating the safety and efficacy of Amber has inherent limitations, including a limited sample size, heterogeneity of clinical indications, and the absence of long-term follow-up data. To address these limitations and further characterize the safety and efficacy profile of Amber as a liquid embolic agent system for complete peripheral vascular occlusion, a Stage II trial with a 6-month follow-up is currently underway.

In conclusion, this Stage I trial provides promising evidence that Amber is a safe and effective liquid embolic system for peripheral vascular occlusion. Further validation in larger, controlled studies with extended follow-up is warranted to confirm these initial findings and fully establish its clinical utility.

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Figures



Figure 1

Components of Amber SEL-P. It contains: 1 vial of amber 20 (1,5 ml): Non-adhesive embolic liquid composed of a polymer dissolved in DMSO (dimethyl sulfoxide). 1 vial of DMSO (1,5 ml): Organic solvent used for the administration of amber 20. 1 Syringe set: Contains 2 syringes for administration of amber 20 and 1 syringe for DMSO.

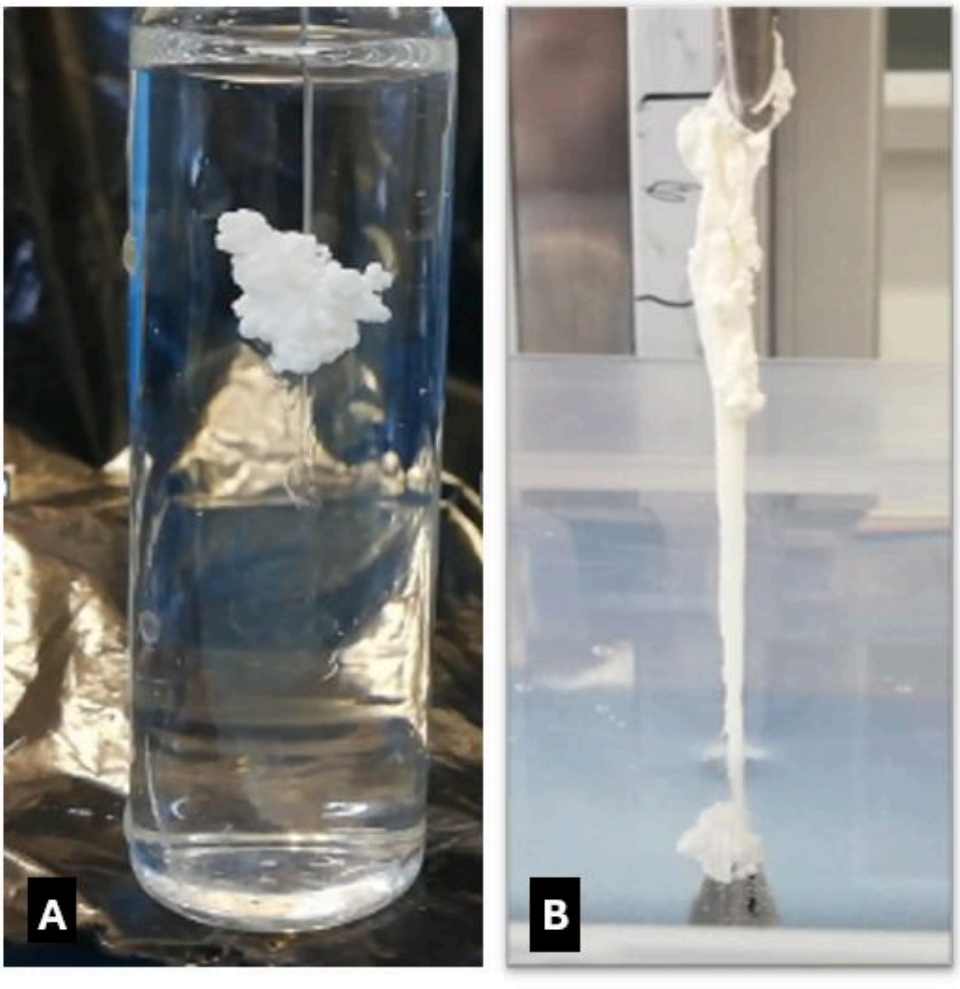


Figure 2

Study device: *Amber SEL-P* .Upon contact with the aqueous environment within the vasculature, an exchange of media (DMSO-aqueous medium) takes place, and a progressive precipitation process begins (A). Representative image illustrating the cohesive nature of Amber; the product maintains elasticity and resists fragmentation (B).

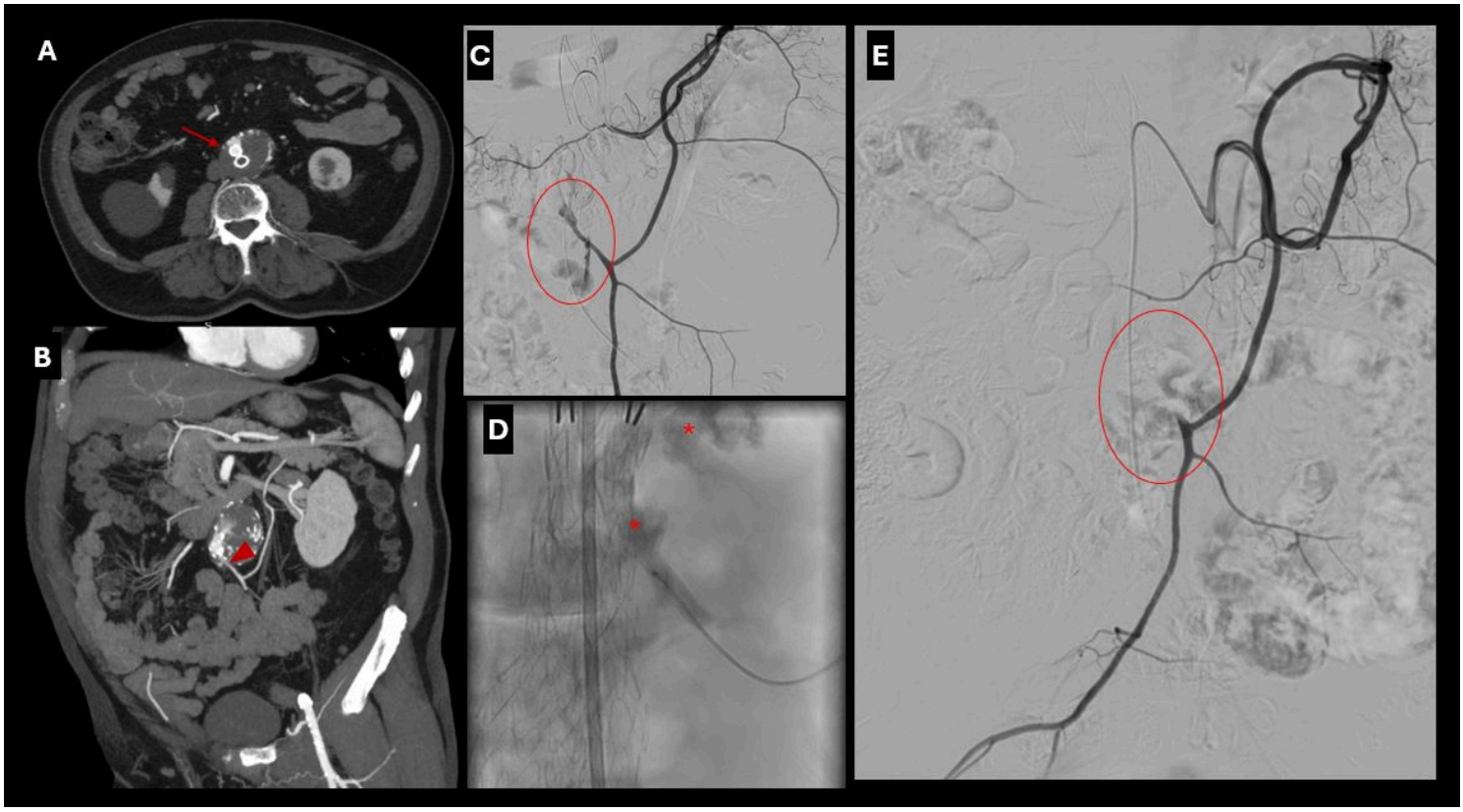


Figure 3

Type II endoleak. Male patient with a history of abdominal aortic aneurysm treated with EVAR. A-B. AngioCT shows Type II endoleak (arrow in A) originating from the inferior mesenteric artery (IMA) (origen of IMA, arrow head in B). C. Selective arteriography from IMA shows endoleak (circle). D. Distribution of Amber SEL-P within the sac (asterisks). E. Control arteriography demonstrating resolution of the endoleak (circle).

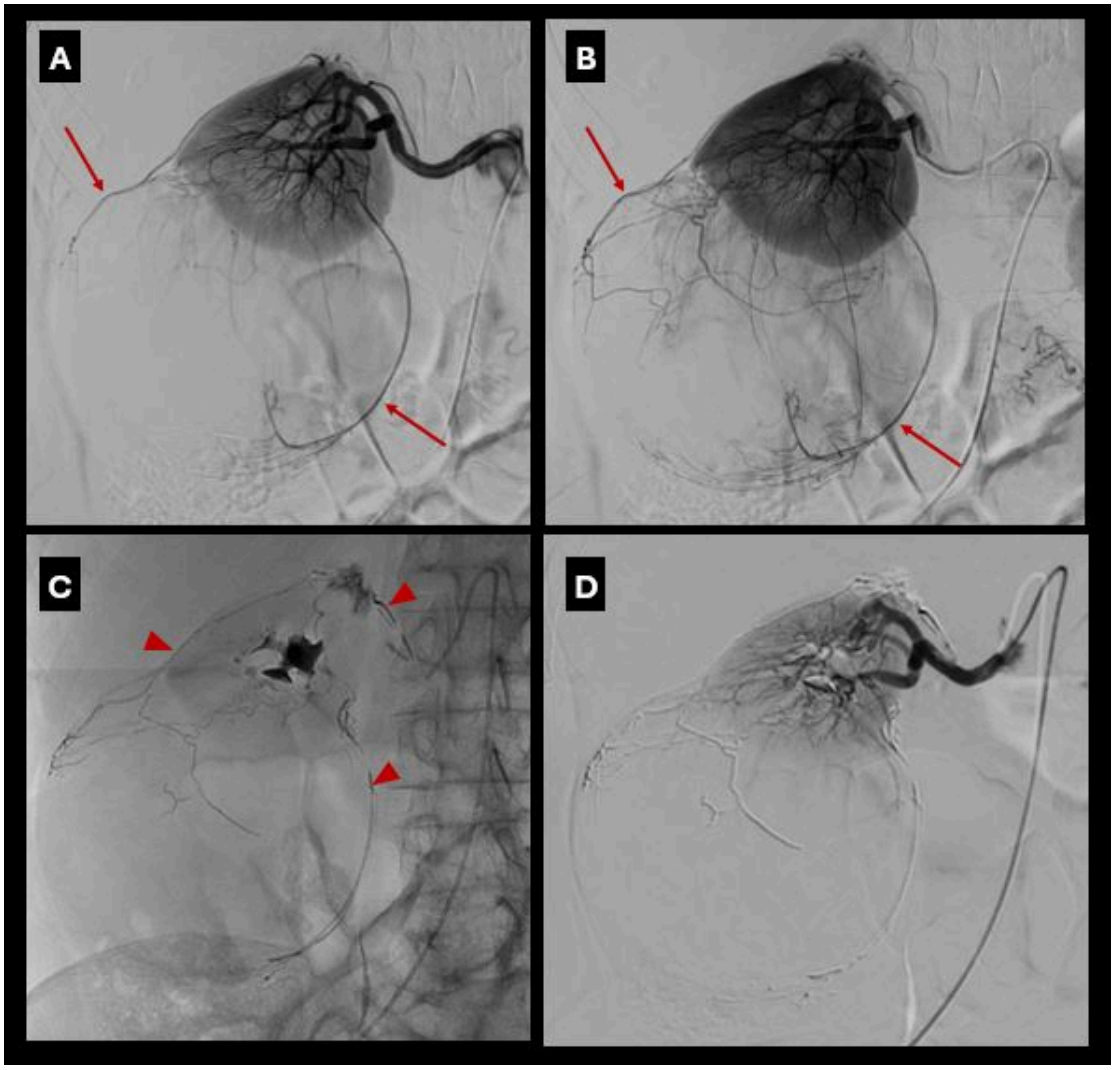


Figure 4

Hypervascular tumor, angiomiolipoma. A–B. Initial arteriography showing a hypervascular lesion in the lower third of the right kidney, consistent with an angiomyolipoma (arrows). C. Control image without subtraction and without contrast, demonstrating thevascular distribution of Amber (arrow head). D. Final control arteriography showing devascularization of the lesion.