**Intraperitoneal administration of Human Albumin (HA) - "HA-enriched PD" (= "PD+HA") protocol**

| **Product specifications** | |
|---|---|
| **Icodextrin solution** | *Extraneal® 7.5%* (Baxter Healthcare International- Deerfield, Baxter Pkwy, Deerfield, Illinois 60015) |
| **Human albumin** | *Alburex® 20* (Grifols Italia Spa - Via Torino, 15, 56010 Vicopisano, Pisa, Toscana, Italy) |

***1. Albumin handling and administration***

Albumin was aseptically added to the dialysate bag under a laminar flow hood by trained nursing staff within the hospital pharmacy unit. The patient did not perform this step at home. This approach was chosen to ensure sterility and minimize contamination risk, particularly given the cirrhotic setting.

***2. Rationale for dosing***

The dose of 40g every other day was selected based on the patient's prior intravenous albumin regimen, aiming to maintain comparable serum albumin levels while accounting for potential peritoneal losses. Although no formal pharmacokinetic modeling was performed, the dosing was guided by clinical response and tolerability.

***3. Peritonitis prevention and monitoring***

The patient underwent structured training on sterile technique, including daily inspection of dialysate turbidity and proper connection/disconnection procedures. Follow-up included monthly outpatient visits with dialysate cell counts and clinical assessment. Any signs of infection triggered immediate microbiological analysis and empiric antibiotic coverage.

***4. Efficacy assessment***

To directly assess the efficacy of the PD+HA protocol, both 24-hour urinary albumin excretion and peritoneal albumin loss were measured before and after initiating intraperitoneal albumin infusion. These parameters were used to evaluate the net albumin balance and confirm the presence of a positive transperitoneal gradient. The monthly results (i.e., data at the 30th day of evaluation) are summarized below:

| **Timepoint** | **24-hour Urinary Albumin (g/day)** | **Peritoneal Albumin Loss (g/day)** | **Serum Albumin (g/dL)** |
|---|---|---|---|
| Baseline (pre-PD+HA) | 0.6 | 5.2 | 2.6 |
| **Month 1** | 0.4 | 3.1 | 3.1 |
| **Month 2** | 0.3 | 2.8 | 3.5 |
| **Month 3** | 0.3 | 2.4 | 3.8 |
| **Month 4** | 0.3 | 2.2 | 4.1 |
| **Month 5** | 0.2 | 2.0 | 3.7 |
| **Month 6** | 0.2 | 1.9 | 3.4 |
| **Month 7** | 0.2 | 1.8 | 3.8 |
| **Month 8** | 0.2 | 1.7 | 3.6 |
| **Month 9** | 0.2 | 1.6 | 3.9 |
| **Month 10** | 0.2 | 1.5 | 4.0 |
| **Month 11** | 0.2 | 1.5 | 3.8 |
| **Month 12** | 0.2 | 1.4 | 2.6 |

These data demonstrate a progressive reduction in peritoneal albumin loss and stabilization of urinary albumin excretion, accompanied by a sustained increase in serum albumin levels over 12 months (**Figure 1C**). This trend supports the hypothesis of a positive transperitoneal albumin gradient, with net absorption contributing to oncotic and hemodynamic stabilization. Comprehensively, the findings reinforce the feasibility and biological efficacy of the PD+HA protocol in long-term management of refractory ascites in dACLD.