Transnodal lymphography in the diagnostic and treatment of genital lymphedema

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Purpose

To report the technical and clinical success of groin nodal lymphography in the diagnostic and treatment of genital lymphedema.
Methods and Materials

We present three consecutive cases seen in our Department. There were one female (8 years old) and two male (69 and 31 years old) patients, all with persistent genital lymphedema failing to conservative treatment. The girl also presented lymphorrhagia. The institutional ethics committee approved the study and informed consent was always obtained before the patients underwent the procedure. The cases were presented at a multidisciplinary clinical session and individually assessed.

Genital lymphedema was due to radical cystectomy (older man), lymphatic malformation (girl) and idiopathic lymphadenitis (younger man). All of them underwent US-guided bilateral groin lymph node puncture with a 25 G needle. Afterwards, 4 to 8 ml of Lipiodol Ultra-Fluid® (Guerbet©, Paris, France) were injected at a rate of 0.2 ml/sec. Lipiodol progression was assessed by means of fluoroscopy. A cone beam CT scan of the pelvis was performed immediately after the procedure on an Allura Xper FD20/20 angiography (Philips, Best, the Netherlands). Twenty-four hours after the procedure, a 64-row multidetector CT (Brilliance, Philips Medical Systems, Cleveland, USA) of the abdomen and pelvis was obtained to confirm and locate the lymphatic leak.

Clinical and imaging follow-up evaluation was obtained between 5 and 11 months respectively. Technical success was considered as bilateral pelvic and abdominal filling of lymphatic vessels. Therapeutic success was considered as genital lymphedema and/or lymphorrhagia significant improvement or disappearance.
Results

Patient 1

An 8 years-old girl suffered from sudden genital lymphedema and lymphorrhagia after a trip to Jakarta VV months before. No other significant records were found. No filariasis or other infective disease was diagnosed.

Under general anaesthesia, bilateral groin lymph nodes where identified by means of US. Two 25 G needle were placed under US-guidance at the lymph nodes hilum. Then, 4 mL of Lipiodol Ultra-Fluid ® were injected at a rate of 0.2 ml/sec to avoid contrast extravasations. Lipiodol progression was assessed by means of fluoroscopy immediately after the injection to check the adequate lymphatic filling and after that, at 1, 3, 5, 10, 15, 30 and 45 minutes. At 30 and 45 minutes hypertrophy of lymphatic ducts (figure 1) and vaginal leak were observed (figure 2). The day after the procedure, a CT scan was obtained and a lymphatico pelvic fistula in the right kidney was depicted as the presence of Lipiodol within the right kidney parenchyma (figure 3). Also genital lymphatic hypertrophy arrpund the uterus and vagina was appreciated (figure 4). During the follow up period the amount of lymphorrhagia was progressively reduced from the needs of diapers to just none compress. Genital lymphedema was also progressively reduced and the discomfort disappeared. After 10 months, the girl is asymptomatic with no lymphorrhagia neither lymphedema.

Patient 2

A 69 years old man suffering genital lymphedema was admitted to the hospital. Clinical records showed radical cystectomy for bladder cancer (pT2-N0-M0) in August 2007, malignant ureterectomy in July 2009 and pelvic floor including penis resection in January 2010. He specially complained for being unable to lay down in the prone position and in some occasions in supine position due to hypersensitivity in the scrotum. After US identification of the lymphatic nodes at both groins, 5 mL of 2% lidocaine (B-Braun Medical Inc.) were locally injected and two 23 G needles placed at the nodes hilums and 8 mL of Lipiodol Ultra-Fluid ® were injected at a rate of 0.2 mL/sec. Lipiodol progression was fluoroscopically assessed at the same times as in Patient 1 showing normal progression of the contrast material in the left side with difficult to progress in the right side (figure 5). The 24 hours control CT showed Lipiodol reflux to the scrotum with lymphatic leak from pelvic right vessels causing the lymphedema (figure 6). Up to 8 months follow up, the patient improved aesthetically and clinically, being able to lay down in the prone position.

Patient 3
A 31 years old man suffered from genital lymphedema. The clinical record did not show significant findings. Two 23 G needles were bilaterally placed in the lymphatic nodes under US-guidance and 5 mL of Lipiodol Ultra-Fluid® were injected at a rate of 0.2 mL/sec after local anaesthesia with 2% lidocaine (B-Braun Medical Inc.). A lymphatic reflux to the scrotum was observed in the left side since 5 minutes after the injection and at the post procedure cone beam CT at the angiography suite (figures 6 and 7). On the 24 hours delayed CT, the reflux was no longer appreciated and Lipiodol was accumulated in the scrotum. At 5 month follow up, a large clinical improvement with significant pain and lymphedema reduction was confirmed.
Fig. 1: Image showing lymphatic hyperplasia in the pelvis

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Fig. 2: Vaginal leak consistent with lymphorrhage (arrow)

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**Fig. 3:** Lipiodol within the kidney parenchima due to lymphopelvic fistula (arrow).

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**Fig. 4:** Lipiodol within the kidney parenchima due to lymphopelvic fistula (arrow). Lymphatic hyperplasia in the pelvic organs (curved arrow).

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**Fig. 5:** Transnodal puncture with a 23 G needle (arrow head). Normal lipiodol progression through the lymphatic system (curved arrow).

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Fig. 6: Lipiodol reflux to the scrotum (arrow) and difficulty to progress in the right side.

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**Fig. 7:** Left lipiodol reflux to the scrotum after direct transnodal lymphangiography (arrow)

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**Fig. 8:** 3-D cone beam CT reconstruction showing left lipiodol reflux to the scrotum after direct transnodal lymphangiography (arrow.)

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Conclusion

Therapeutic lymphangiography by lymph node injection seems to be effective in the treatment of genital lymphedema. Lymph node puncture lymphangiography is feasible and less cumbersome than pedal lymphangiography.


