



Time for diagnostics...

Remember how...

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Jugular vein catheter placement Indications & technique

Indications

Jugular vein catheter (JVC) placement in the dog is a relatively quick and easy to be performed procedure that does not demand sedation of the animal, although the presence of a veterinary nurse is deemed necessary. Various catheter types that are appropriate for jugular vein catheterization are available in the market. Catheters designed for humans can also be used. Jugular vein catheters are categorized according to the number of channels that they have (single-channeled, double-channeled, triple-channeled), their length (6 to 18 cm) and their diameter (14 to 20 gauge). The length and diameter of the JVC that will be used are analogous to the dog's body size, while the number of channels is chosen according to the purpose that the catheter is going to be used. For example, if JVC is placed for caustic drug administration (intravenous administration of doxycyclin) a single-channeled type is chosen, while if JVC placement is decided for long-term

fluid administration a multi-channeled type is preferred. If a JVC is not available at the veterinary clinic a simple over the needle vein catheter (16 or 18 gauge) can be used. The most common indications for JVC placement in the dog are:

- A. Long-term fluid administration (e.g. chronic renal failure)
- B. Parenteral nutrition (high diameter veins are demanded)
- C. Measurement of central venous pressure
- D. Multiple blood samples in short term (e.g. diabetes mellitus) or multiple blood samples or drug administration to fractious animals
- E. Blood transfusion

The most serious contradictions for JVC placement are:

- A. Non cooperative animal to whom sedation is forbidden for JVC placement (sedation is not a

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Figure 1. Standard kit for jugular vein catheterization.



Figure 2. The dog is placed in lateral recumbancy. The neck is shaved.



Figure 3. Skin over the jugular furrow is surgically prepped.





requirement for the placement of JVC in cooperative animals)

B. Severe coagulopathies

Complications related to JVC placement, even though they are rare, can be seen both upon placement and during long-term presence of the catheter in the jugular vein. When rules regarding safe placement are followed as well as hygiene rules, complications can be prevented. Some of the most common are:

A. Severe blood loss upon procedure

B. Vein rupture upon catheter placement

C. Arrhythmias

D. Phlebitis

E. Bacterial endocarditis

F. Septicemia

G. Air embolism

H. Skin infection at the insertion site

I. Head and neck edema due to tight bandaging

Procedure of jugular vein catheter placement

In figures 1-14 a step by step, placement of a triple-channeled jugular vein catheter in a nine

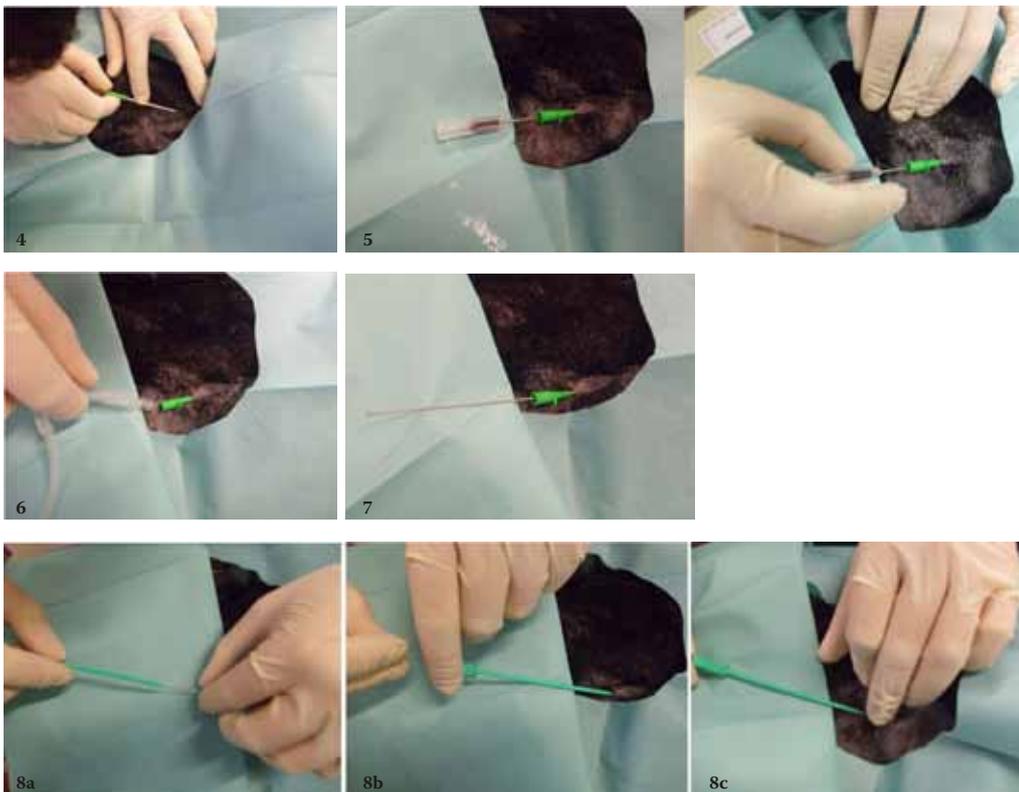


Figure 4. A sterile field is applied over the dog's head and neck and a hole is created above the jugular furrow. An assistant occludes vein by applying pressure centrally to the catheter's insertion point. The catheter is slide into the vessel.

Figure 5. When blood appears into catheter's hub, the needle is detached and removed, while the catheter is further advanced into the vein.

Figure 6. The plastic sheath that contains the guide wire is connected to the free end of the catheter and is pushed through the catheter. The wire will act as a guide for the multi-channeled catheter through the skin and into the jugular vein.

Figure 7. The guide wire is advanced further into the vessel. The catheter is removed and only the guide wire is maintained into the vein.

Figure 8 A plastic dilator is passed over the guide wire to dilate the skin hole (**a**) and thus facilitate the insertion of the multi-channeled catheter through the skin and into the jugular vein. Twisting backwards and forwards movements of the plastic dilator are made (**b, c**).





year old, male, German shorthair pointer dog suffering for chronic renal failure. The procedure was performed by one veterinarian and its nurse, and without sedation.

2. Bexfield N, Lee K. Intravenous catheter placement – (b) jugular vein (modified Seldinger technique). In: BSAVA guide to procedures in small animal practice. BSAVA: Gloucester, 2011, pp. 128-131.

3. Mesfin GM, Higgins MJ, Brown WP, Rosnick D. Cardiovascular complications of chronic catheterization of the jugular vein in the dog. *Vet Pathol* 1988, 25 (6): 492-502.

Suggested reading

1. Abrams-Ogg ACG, Kruth SA, Carter RF, Valli VEO, Kamel-Reid S, Dube JD. The use of an implantable central venous (Hickman) catheter for long term venous access in dogs undergoing bone marrow transplantation. *Can J Vet Res* 1992, 56(4): 382-386.

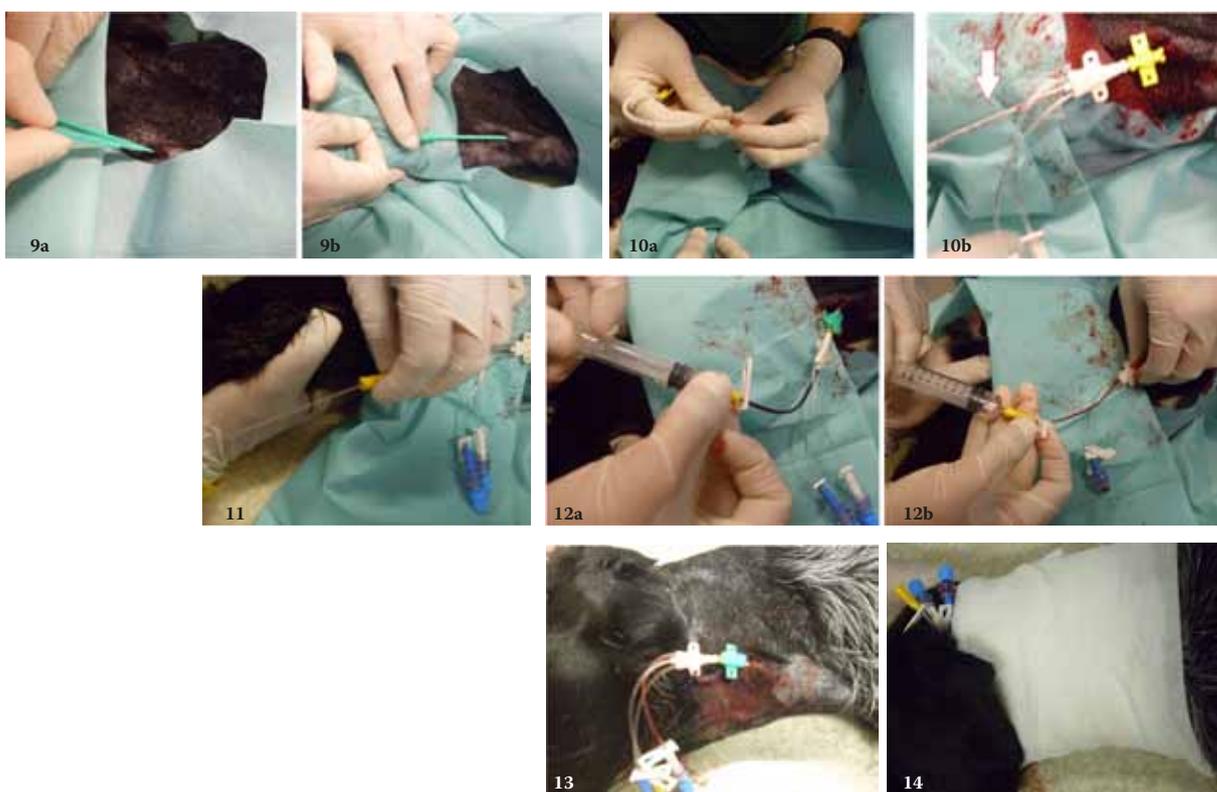


Figure 9. a) If the plastic dilator is not easily advanced through the skin a small incision can be made by a scalpel. **b)** The plastic dilator is then easily carried forward through the skin.

Figure 10. a) The plastic dilator is removed. The multi-channelled catheter is passed over the guide wire and is advanced forward through the skin and into the jugular vein. **b)** The end of the guide wire will show through one of the channels of the multi-channelled catheter (white arrow), while the last has been fully slide in the jugular vein.

Figure 11. The guide wire is removed through the channel that has appeared.

Figure 12. a) Blood is aspirated from all multi-channelled catheter lumens to make sure that they are patent. **b)** Then all catheter channels are flushed with heparinized saline to prevent clot formation into their lumen.

Figure 13. The multi-channelled catheter is sutured in place with non-absorbable sutures.

Figure 14. The multi-channelled catheter is cover with bandage applied the neck.

