

# FIRST CLINICAL EXPERIENCE OF ANKAFERD BLOODSTOPPER AS A HEMOSTATIC AGENT IN PARTIAL NEPHRECTOMY

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Open partial nephrectomy is an effective and safe alternative treatment modality to radical nephrectomy for small renal tumors. Many techniques that use hemostatic agents have been described to provide hemostasis during this procedure. Ankaferd BloodStopper® (ABS) is a unique folkloric medicinal plant extract that has been used historically in Turkish traditional medicine as a hemostatic agent. ABS has therapeutic potential to manage hemorrhage and this agent should be investigated in clinical trials. In the present case, we evaluated the effectiveness of ABS in partial nephrectomy and reviewed the literature.

**Key Words:** Ankaferd BloodStopper, hemostasis, partial nephrectomy  
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The incidence of renal tumors has increased during the past two decades. This is probably due to the increased use of abdominal ultrasound and computed tomography for abdominal diseases [1]. Incidental renal tumors are smaller and less likely to metastasize [2]. Therefore, surgical treatment of renal tumors has developed towards conservative surgery of the renal parenchyma and the use of minimally invasive techniques. During the past decade, partial nephrectomy has been accepted as an effective and safe alternative to radical nephrectomy for small renal cortical tumors [3] which is a well-known surgical procedure that may cause major bleeding. Hemostatic agents have an important role during open partial nephrectomy. Many of them have been reported to stop hemorrhage as renal parenchymal hemostatic aids, glues and other substances [4].

Ankaferd BloodStopper (ABS) is a unique folkloric medicinal plant extract, which has historically

been used in Turkish traditional medicine as a hemostatic agent. ABS has some effects on the endothelium, blood cells, angiogenesis, cellular proliferation, vascular dynamics and cell mediators [5]. In this case study, we evaluated the hemostatic effect of local ABS application in a patient who underwent open partial nephrectomy.

## CASE PRESENTATION

A 72-year-old man presented to the outpatient clinic with dull aching pain in the right loin. Disease-specific history taking, physical examination, and blood and urine analysis were performed. The pain pattern was intermittent. He had no lower urinary tract symptoms, hematuria or fever. Physical examination revealed a normal abdomen and external genitalia. Blood and urine analyses were normal. Urinary ultrasound and computed tomography showed a 42×36 mm exophytic mass at the lower pole of right kidney (Figure 1). Open partial nephrectomy was performed. We investigated the effect of ABS as a hemostatic agent during the procedure. The patient gave signed informed consent that authorized us to use ABS during the procedure.



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A flank incision approach was used for opening Gerota's fascia onto the site of the tumor and localizing the kidney and the tumor. Warm ischemia was not performed for this lesion. The tumor was resected with a safety margin of 5 mm of healthy renal parenchyma. Total resection of the tumor was completed without recourse to any type of renal ischemia. An intraoperative frozen section biopsy of the tumor bed was performed. ABS tampons 5×7 cm (including 10 mL ABS solution) were used to provide hemostasis. The application was performed by compressing the ABS tampon onto the bleeding region for at least 2 minutes (Figure 2). Following excision of the renal lesion, major bleeding was observed from the base of the excised renal mass. An ABS tampon was immediately compressed onto the bleeding area until the bleeding stopped. During compression, 5 mL of adjuvant ABS solution was added to the tampon manually. The ABS tampons are non-absorbent; therefore, we had to remove the tampon when the bleeding stopped. While performing partial nephrectomy, only monopolar cauterization was applied to the minor bleeding points.

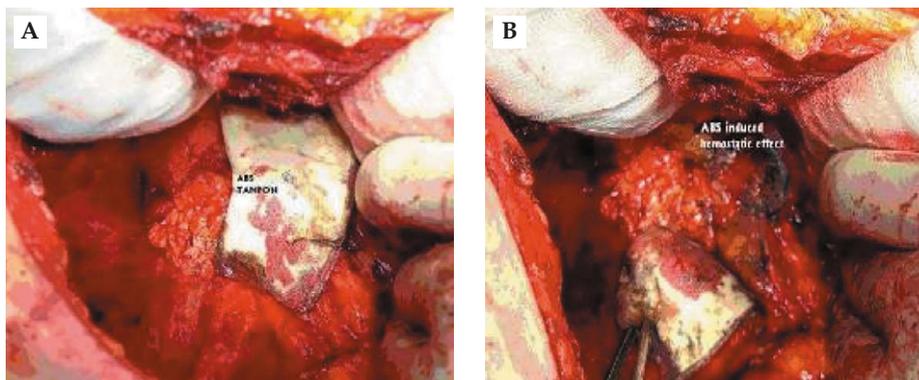


**Figure 1.** Preoperative computed tomography showed a 42×36 mm exophytic right renal mass at the lower pole.

No additional hemostatic agent was used. Allergic reaction, acute toxicity, complications and renal tissue injury were not observed perioperatively. We found that a well-compressed ABS tampon was sufficient to achieve hemostasis. The operation time was 100 minutes. The amount of blood loss was nearly 300 mL. No blood transfusion was required. The pathological examination report was renal cell carcinoma, conventional type Fuhrman grade II. No postoperative complication was detected at the first month of follow-up.

## DISCUSSION

Radical nephrectomy is the standard treatment for localized unilateral renal tumors, with a normally functioning contralateral kidney [6]. However, recent data have suggested that partial nephrectomy has become the gold standard for renal tumors ≤4 cm, with demonstrated oncological and improved renal functional outcomes that are similar to those of radical nephrectomy [7]. Injury to adjacent organs, major vessel and vascular injury, and hemorrhage are some of the complications of this procedure that might necessitate transfusion [8]. As a result of the risk of bleeding, providing hemostasis is important for this procedure. In partial nephrectomy, there might also be a risk of renal dysfunction if a vascular clamp is used for control of bleeding. The development of surgical tools and minimally invasive techniques that allow bloodless and non-traumatic resection of the renal parenchyma make it possible to perform partial nephrectomy without clamping the renal pedicle. Many techniques to provide hemostasis in partial nephrectomy have been developed, such as intracorporeal suturing, microwave



**Figure 2.** Intraoperative application of Ankaferd BloodStopper tampons.

tissue coagulation, spray coagulation, application of fibrinogen hemostatic patches, and hemostatic agents. Here, we studied the role of the hemostatic agent ABS in partial nephrectomy.

ABS is composed of a mixture of five plants, including 5 mg *Thymus vulgaris*, 9 mg *Glycyrrhiza glabra*, 8 mg *Vitis vinifera*, 7 mg *Alpinia officinarum* and 6 mg *Urtica dioica* in 100 mL Ankaferd solution. The basic ABS mechanism of action is the formation of an encapsulated protein network that provides focal points for vital erythrocyte aggregation. The protein network induced by ABS forms rapidly (<1 sec). However, blood cells, particularly erythrocytes, participate in protein network formation. It has been shown that the ABS-induced protein network is capable of regulating further coagulation and hemostatic reactions [5].

ABS is a licensed medicinal plant product that provides active hemostasis in external, postoperative and dental bleeding and is approved in Turkey by the Ministry of Health. The use of ABS for internal organ hemorrhage is under investigation [5]. After studying the effects of ABS in an experimental controlled trial of rat partial nephrectomy [9], the first clinical application of ABS in a urological procedure was made by our clinic in radical retropubic prostatectomy [10]. Additionally, this is believed to be the first case to evaluate the efficacy of ABS in open partial nephrectomy.

Several hemostatic agents have been investigated for their potential for managing vascular injury, and many have also been evaluated for their efficacy for repairing collecting duct injury. Pursifull and Morey have reviewed the use of fibrin sealant and gelatin matrix, and Desai et al and Gill et al studied the effectiveness of gelatin matrix in open and laparoscopic partial nephrectomy models [11–13]. Recent studies have shown the potential efficacy of these materials for decreasing hemorrhage.

We observed that ABS was successfully applied to stop bleeding without suturing the renal parenchyma, and this application on the transected kidney area provided active hemostasis in partial nephrectomy. In our opinion, ABS has a major effect on active hemostasis during partial nephrectomy. However, major bleeding from renal tissue could be controlled with extra doses of ABS solution, which were applied to the bleeding area. We suggest this application method to provide active hemostasis in renal tissue.

In our opinion, the observation of ineffective hemostasis with ABS will be the main reason to provide hemostasis with traditional methods such as suturing and monopolar cautery. However, randomized, controlled, double-blind clinical trials to investigate the hemostatic effect of ABS in renal bleeding need to be designed.

## REFERENCES

1. Janzen NK, Kim HL, Figlin RA, et al. Surveillance after radical or partial nephrectomy for localized renal cell carcinoma and management of recurrent disease. *Urol Clin North Am* 2003;30:843–52.
2. Patard JJ, Dorey FJ, Cindolo L, et al. Symptoms as well as tumor size provide prognostic information on patients with localized renal tumors. *J Urol* 2004;172: 2167–71.
3. Novick AC, Campbell SC. ‘Tumores renales’. In: Walsh PC, et al., eds. *Campbell’s Urology*. Buenos Aires: Editorial Panamericana, 2005:2911–79.
4. Thompson T, Chi-Fai N, Tolley D. Renal parenchymal hemostatic aids: glues and things. *Curr Opin Urol* 2003; 13:209–14.
5. Göker H, Haznedaroğlu IC, Erçetin S, et al. Haemostatic actions of the folkloric medicinal plant extract Ankaferd BloodStopper. *J Int Med Res* 2008;36:163–70.
6. Lee CT, Katz J, Shi W, et al. Surgical management of renal tumors 4 cm or less in a contemporary cohort. *J Urol* 2000;163:730–6.
7. Van Poppel H, Bamelis B, Oyen R, et al. Partial nephrectomy for renal cell carcinoma can achieve long-term tumor control. *J Urol* 1998;160:674–8.
8. Campbell SC, Novick AC, Stroom SB, et al. Complications of nephron sparing surgery for renal tumors. *J Urol* 1994;151:1177–80.
9. Huri E, Akgül T, Ayyıldız A, et al. Hemostatic role of a folkloric medicinal plant extract in a rat partial nephrectomy model: controlled experimental trial. *J Urol* 2009;181:2349–54.
10. Huri E, Akgül T, Ayyıldız A, et al. Hemostasis in radical retropubic prostatectomy with Ankaferd Blood-Stopper: a case report. *Kaohsiung J Med Sci* 2009;25: 445–7.
11. Pursifull NF, Morey AF. Tissue glues and nonsuturing techniques. *Curr Opin Urol* 2007;17:396–401.
12. Desai PJ, Maynes LJ, Zuppan C, et al. Hand assisted laparoscopic partial nephrectomy in the porcine model using gelatin matrix hemostatic sealant without hilar occlusion. *J Endourol* 2005;19:566–9.
13. Gill IS, Ramani AP, Spaliviero M, et al. Improved hemostasis during laparoscopic partial nephrectomy using gelatin matrix thrombin sealant. *Urology* 2005;65: 463–6.