

# Tips for Arthroscopic Anterior Cruciate Reconstruction without the Tourniquet\*

## *Dicas para reconstrução artroscópica do cruzado anterior sem o torniquete*

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Rev Bras Ortop 2021;56(2):256–257.

### Abstract

#### Keywords

- ▶ anterior cruciate ligament reconstruction
- ▶ tourniquets
- ▶ anterior cruciate ligament injuries

The arthroscopic reconstruction of the anterior cruciate ligament is a common surgery performed by the orthopedic surgeons willing to restore the knee stability of physically active patients. Despite the fact that it is usually an uneventful procedure, surgeons must always look for better post-operative results; in this scenario, the arthroscopic reconstruction of the anterior cruciate ligament without a tourniquet is a promising alternative. The aim of the present paper is to share with other orthopedic surgeons around the world our experience with this procedure and some technical tips that may be helpful.

### Resumo

#### Palavras-chave

- ▶ reconstrução do ligamento cruzado anterior
- ▶ torniquetes
- ▶ lesões do ligamento cruzado anterior

A reconstrução artroscópica do ligamento cruzado anterior é uma cirurgia comum realizada pelos cirurgiões ortopédicos dispostos a restaurar a estabilidade do joelho de pacientes fisicamente ativos. Apesar de ser geralmente um procedimento sem intercorrências, os cirurgiões devem sempre procurar melhores resultados pós-operatórios; neste cenário a reconstrução artroscópica do ligamento anterior sem torniquete é uma alternativa promissora. O objetivo deste artigo é compartilhar com outros cirurgiões ortopédicos ao redor do mundo nossa experiência com este procedimento e algumas dicas técnicas que podem ser úteis.

## Introduction

The arthroscopic reconstruction of the anterior cruciate ligament (ARACL) is one of the most performed orthopedic surgeries. In the United States, the incidence of ARACL is

estimated to be over 130 thousand,<sup>1</sup> and it may reach over than 400 thousand worldwide.

The main goals of the ARACL are to restore knee stability and enable patients to return without restrictions to sports and daily life activities. Reaching these goals with diminished iatrogenic complications should be an effort made by all orthopedic surgeons.

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received  
August 14, 2020  
accepted  
September 17, 2020

DOI <https://doi.org/10.1055/s-0040-1722583>.  
ISSN 0102-3616.

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Recently, ARACL without a tourniquet became an emerging trend worldwide, since the operative time does not seem to increase,<sup>2,3</sup> and the patients seem to fare better in the early postoperative weeks.<sup>4,5</sup> The supposed benefits of the reconstruction without a tourniquet are an earlier recovery of quadriceps strength, smaller thigh girth atrophy,<sup>4</sup> decreased blood loss,<sup>2</sup> smaller postoperative pain,<sup>6</sup> and fewer electromyographic effects.<sup>5</sup> The use of the tourniquet was also associated to postoperative tibial, femoral, and saphenous nerve palsy.<sup>7,8</sup>

In the last few years, due to the logistic difficulties in having a good working tourniquet in a public hospital in a developing country, our team performed a few ARACLs without tourniquets. Our anecdotal experience is similar to that of some other groups: patients subjected to an ARACL without tourniquet fare better than the ones subjected to the same procedure with a tourniquet.

Despite the potential benefits of the ARACL without a tourniquet, the perioperative period can be tricky due to the intra-articular bleeding, especially after drilling the bone tunnels. Blood makes it almost impossible for the surgeon to identify the structure in the first few minutes, and for those not prepared for this scenario the surgery may become strenuous. It is our intention with the present paper to share some tips acquired with the forced experience we have had, and maybe in the near future better trials comparing ARACL with or without the use of a tourniquet will help the orthopedic surgeon in the clinical decision.

### Surgical Technique

Our tips are:

- Start trying with a deflated tourniquet in place, and, whenever you feel uncomfortable, inflate the tourniquet and go ahead.
- When harvesting the hamstring autograft, be sure to cut all of the vincula, and split the semitendinosus and the gracilis from the sartorius fascia before using the tendon stripper.
- Keep away from the Hoffa fat-pad as much as possible. The anterolateral portal should be made high and tight, the anteromedial portal should be made a bit more medial than usual.
- Be patient. The surgeon must keep calm throughout the first few minutes of bleeding. It will get better.
- Increase the pressure and the flow in the saline pump. If you do not use a pump, place the saline bag as high as possible.
- Cold saline is also a good option to decrease the bleeding.
- Endovenous tranexamic acid (1 g) may be helpful.
- Prefer to shave the ligamentum mucosum instead of shaving the Hoffa fat-pad.
- Adrenaline at 1mg for each 1L of saline may be helpful, mainly in the first few minutes. If necessary, 1mg of adrenaline directly in the joint will definitely help.
- Start with the arthroscopic steps that do not require shaving of the synovia: inspection and meniscal tears.
- Avoid unnecessary bone shaving or bone curettage.
- Place both tibial and femoral guide pins in the desired location before drilling the bone tunnels.
- If you chose a femoral outside-in technique, try to not open the capsule with the scalpel.
- If you have chosen a transportal technique, start with the tibial guide pin before flexing the knee to place the femoral guide pin.
- Always start by drilling the femoral tunnel.

### Final Considerations

Despite the fact that most surgeons do not feel comfortable with the ARACL without a tourniquet, it is a feasible and safe procedure that has potential short-term benefits to the patients. These elementary technical tips, will surely make the surgery easier and the surgeons more confident to no longer use the tourniquet.

#### Conflict of Interests

The authors have no conflict of interests to declare.

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