

The axillary access in thyroid resection: a new endoscopic method



KAI WITZEL

Surgical Department, HELIOS St. Elisabeth Hospital Hünfeld

Endoscopic thyroid resections should meet the standards of minimally invasive surgery. Consequently, a minimally invasive resection of the thyroid gland should not be a compromise: it should be as safe as open surgery, and the thyroid gland must be extracted without enlarging the incision. Besides, it should meet cosmetic demands,



Picture 1: The endoscopic access under visual control

which means that it should be carried out without leaving a prominent scar in the front neck region. We present the intermediate results of our proof of concept study with 15 patients.

In the course of this study we will show that a resection of the thyroid using a 20 mm axillary access and a 3,5 mm incision in the jugulum is possible, thus avoiding the above mentioned scar. For this technique, a modified axilloscope and an ultrasonic scalpel are used, which permit a total resection of the unilateral thyroid with partial resection of the contralateral side. The technique was successfully applied in thyroid operations of corpses and living pigs. At present, the results suggest that this technique is likely to become a standard alternative to open thyroid surgery for up to 20

being used for identifying the recurrent laryngeal nerve. In the other two operations we made a subtotal resection including the isthmus. In one of these cases, the neuro-monitoring system was used, in the other case, the risks that a further search for the nerve implied lead to our decision to refrain from drawing on the neuro-monitoring system. In none of these 11 patients were any bleeding or infection or any other complications observed.

The patients staid in hospital for an average of 3.4 days. Our subjective impression is that patients suffer less from perioperative pain than after open surgery. An ultrasonic contol after the operation showed the correct resection of the pathological tissue in each of the cases. In the follow up examination one year after surgery, the patient came along with regular results.



Picture 4: The axilloscope on the left side

Material and Methods

A 20 to 25 mm incision in the anterior axillary line provides the access for the ipsilateral resection. The modified axilloscope is subsequently introduced. This instrument, consisting of two telescoped tubes, is pushed forwards to the jugulum under visual control so that unnecessary injuries are avoided. When the jugulum is reached, the inner tube with its transparent top is removed so that the ultrasonic scalpel can be introduced for preparation. The space for preparation is created by inflating CO²-Gas at 6mm pressure. Next, a 3 mm incision is made to permit the introduction of a trocar. After localizing the sternocleidomastoid muscle, we start to prepare towards the thyroid along the side of the muscle, making sure not to come too close to the jugular vein. The other neck muscles are divided lengthwise. Due to the lack of anatomical landmarks this is probably the most difficult part of the procedure. After identification of the ipsilateral thyroid we hold and lift it carefully with a forceps. The Medtronic[®] neuro-monitoring system permits to locate the recurrent laryngeal nerve. When the nerve has been identified we start to dissect the thyroid using an ultrasonic scalpel. It is possible to extract the thyroid tissue via the 20 mm tube without its touching other tissue and without enlarging any incision. Patients included in this proof-of-concept study must meet the following requirements:



Picture 2: Our instrument for endoscopic thyroid resections

- unilateral nodes with a size of less than 2,5 centimeters in diameter

with broad shoulders, a compromise needs to be found. This could be to choose a more medial access, which enables the surgeon to use his index to safeguard a correct preparation, but has, considering cosmetic aspects, less acceptable results.

Once the thyroid has been detected it is as simple to identify the nodes as in open surgery. For lifting the thyroid we use sutures that are inserted through the skin.

Identifying the recurrent laryngeal nerve is easier than in open surgery, since the pictures transmitted by the camera are enlarged.

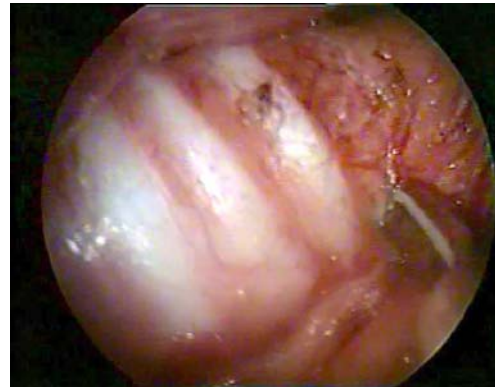
The preparation with the ultrasonic scalpel permits resection without any bleeding. Even the vessels of the upper pole can be cut without clipping. A problem might be the temperature the ultrasonic salpel produces when cutting. One of the animals operated on had an invisible tracheal lesion that we noticed due to a hypodermic emphysema that persisted after we had removed the tracheal tube.

The extraction of the tissue is comfortable and is one of the big advantages of the Witzel procedure. In one of our patients we removed three parts of the thyroid sized 2-3.5 cm x 3 cm x 2 cm.

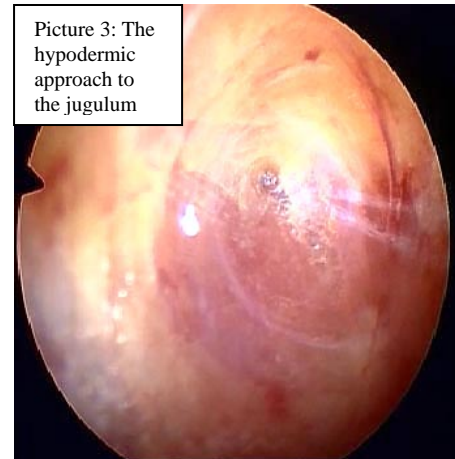
To sum up we can say that this procedure is appropriate for isolated unilateral nodes. Possibly 15 to 20 percent of the patients can be operated in such an endoscopic technique in the future.

Discussion

Our experience with the described procedure shows that the hypodermic access to the jugulum under visual control does not cause any problems. The most complicated step of the procedure is the correct access through the muscels because there are no landmarks to facilitate orientation. It is much easier to find your way using your index finger, which, however, is only possible in slender patients. When operating on patients



Picture 5: The trachea and the recurrent laryngeal nerve after complete thyroidectomy



Picture 3: The hypodermic approach to the jugulum

- no suspicion of malignancy

First results

We have so far operated on 11 patients (10 female, 1 male) according the above described technique, using a left-side access with seven and a right-side access with four patients. The average operation time was 128 minutes (87 to 151 minutes).

Of these 11 patients, 6 had anterolateral isthmus nodes removed; identifying the recurrent laryngeal nerve was considered unnecessary in these operations. However, in three cases 2 nodes in the lower pole were removed with the neuro-monitoring system

Dr. med. Kai Witzel,
36088 Hünfeld, kwitz

linik Schillerstr. 22, D-
ken.de