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## **Match between therapeutic proposal in multidisciplinary tumor board and actual treatment in head and neck cancer**

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**Abstract**

**Objectives:** There are few published studies evaluating the quality and outcome of multidisciplinary tumor board (MDTB) decisions. The aim of the present study was to evaluate adherence to MDTB recommendations in head and neck cancer and to document reasons in case of discordance.

**Material and methods:** We included all patients with newly diagnosed head and neck cancer presented in our MDTB meetings between January 1<sup>st</sup> and December 31<sup>st</sup>, 2018, whatever the tumor site, histology type and TNM classification. MDTB recommendations were compared to actual treatment. Discordance was defined as treatment partially or entirely different from the treatment decision recorded in the MDTB minutes.

**Results:** Board decisions were made for 344 new patients. Complete treatment concordance rate was 91.6% (315/344 patients), with deviation in 29 patients. Reasons for deviation were complications of treatment in 10 cases, patient refusal in 8, and physician's decision in 4 cases. Five patients died before therapy initiation. Mean interval from board discussion to treatment was 21 days, and depended on type of treatment (range, 1 to 74 days).

**Conclusion:** This study shows the importance of evaluating concordance between the protocol proposed in the MDTB and the treatment actually received, to identify factors for deviation and remedy them when possible.

**Keywords:** Multi-disciplinary tumor board; Head and neck cancer; Adherence to treatment recommendation; Deviation.

## **Introduction**

Continuous developments in cancer treatment in recent years have made diagnostic and treatment options more complex. Medical-surgical teamwork, notably in head and neck cancer, is thus increasingly essential, and multidisciplinary tumor boards (MDTB) have become standard practice for treatment decision making in oncology [1].

Since 2005, MDTBs have been mandatory in oncology centers in France [2]. The 2003 Cancer Plan-1 targeted a 100% rate of MDTB discussion of new cases. Board meetings are held regularly, with a quorum comprising at least 1 surgeon, 1 oncologist or onco-radiotherapist and 1 radiologist, plus other specialists according to the affected organ and Board specialty. Strategy is thus personalized according to comorbidity, and should be based on regional, national and international guidelines [2].

MDTB case discussion was shown to improve 5-year survival in stage IV head and neck cancer compared to cases not discussed in MDTB [2]. Likewise, postoperative mortality in colorectal cancer was reduced by systematic MDTB discussion; detection of metachronous cancer was enhanced, although overall survival was unchanged [3]. In lung cancer, survival in inoperable non-small-cell cancer was improved by MDTB discussion [4]. The meetings also improved cooperation between specialists, shortening time to treatment initiation, especially for multimodal treatments [5]. And patients presented in board meetings more readily accepted the proposed treatment [6].

Although the advantages of MDTBs are clearly demonstrated, there is room for improvement to assess quality and adherence to board recommendations and to understand reasons for deviation.

The aim of the present study was therefore to assess concordance between MDTB recommendations and actual treatment in head and neck cancer, and to analyze reasons in case of discordance. The secondary aim was to assess time to treatment initiation after the board meeting.

## **Patients and Methods**

A single-center retrospective descriptive study was conducted in our university hospital ENT and Head and Neck Surgery department for the period January 1 to December 31, 2018. All patents with newly diagnosed head and neck cancer presented in MDTB were included. Exclusion criteria comprised: [a] previous board presentation and treatment for head and neck cancer; [b] metastasis of other primary (e.g., squamous cell carcinoma with oral metastasis); [c] lesion of other histologic type (e.g., melanoma) already presented in another MDTB; [d] case discussed in MDTB in another center, presented here for expert opinion; [e] renewed presentation for recurrence or progression; and [f] second primary. MDTB presentation followed full radiologic and clinical work-up and histologic diagnosis; however, histology results were not always available ahead of the meeting, particularly in the case of lymphadenopathy without known primary, in which case the board recommendations were conditional on histologic findings.

Within our department we communicate using the web-based WebDCR™ cancer patient database developed by Innovelan® for our regional oncology network. It is used for all locations, beginning in November 2014 with head and neck cancer. It contains all the information required for file presentation, including demographics, community physician and MDTB reference physician. There are mandatory items, without which the file cannot be finalized: discovery circumstances, WHO status, comorbidities, TNM staging, paraclinical assessment, biopsy findings, and treatment proposal and diagram. Patients were informed that their data were hosted on the portal and provided consent for their case to be discussed in the MDTB and for anonymized use of data for clinical research. The study conformed to the Declaration of Helsinki (version 2013).

Files are filled out by the patient's managing physician, and the data are checked both before MDTB presentation and after, for final validation. Meetings are weekly, with a quorum of at

least an oncologic surgeon, an onco-radiotherapist and a radiologist. Most cases come from the head and neck or maxillofacial surgery departments, but all cases referred from primary centers in the region for expert opinion are dealt with. The patient can choose to be present or not. Recommendations are drawn up in line with regional and international head and neck cancer guidelines [7]. Once accepted by the patient, the final treatment decision is recorded. After validation by the board coordinator, the file, including final treatment plan, is sent to all relevant specialists, the patient's community physician and the patient. Validated decisions are saved to the website as PDF documents. If the main treatment is surgical, this is usually initiated in the university hospital center. Patients are referred to the oncology/radiotherapy center nearest to their home for radiation therapy, chemotherapy or chemoradiotherapy.

The WebDCR™ portal was used in the study for all cases recorded in 2018. Files not meeting inclusion criteria were excluded. Analysis focused on the validated MDTB protocol. Epidemiological data (age, gender, risk factors) were recorded. The date of the board meeting, primary site, histologic type, TNM (7<sup>th</sup> edition) stage, treatment plan and treatment phase were recorded. The board recommendation was compared against the actual treatment implemented, checked on the Sillage™ database used in our center and on paper files and specialist reports. Time to treatment was noted counting the date of initiation of the first treatment. In similar studies, the terms “deviation”, “discordance” and “implementation” have been used for this comparison [8-10]. In the present study, we defined “discordant” as treatment partly or totally differing from the recorded MDTB proposal. After comparison, two groups were distinguished according to concordance: (a) concordant (board decision identical to treatment), and (b) discordant (decision partially or completely different to treatment). A second classification was drawn up based on reasons for discordance (Table 1). Data and Tables were processed on Microsoft Office Excel 2017®. R studio® software, version 1.2, was

used for multivariate logistic regression to assess significant impact of age, gender, tumor site and/or type of treatment on discordance.

## **Results**

Between January and December 2018, 895 cases were discussed in 50 MDTBs. Treatment decisions were made for 344 new patients. The flowchart is shown in figure 1.

The mean number of presentations per meeting was 6.8. Patient age ranged from 20 to 89 years (median, 64 years), with 77% males and 23% females. Except in carcinoma of unknown primary, tumor site was systematically reported: mostly oral cavity (107; 31.1%), oropharynx (76; 22.1%) or larynx/hypopharynx (109; 31.7%). Histologic findings were systematically available: mainly squamous cell carcinoma (294; 85.5%). TNM stage in more than one-third of cases was T4 (116; 33.7%) at time of board meeting. Three patients were metastatic (M1). Tables 2 and 3 show epidemiologic and clinical data, TNM staging and final histologic type.

For the 344 recommendations, the concordance rate was 91.6% (315 cases), with 29 deviations.

In 10 patients, the deviation was due to a complication in treatment, 6 of which consisted in chemotherapy side-effects; in 8 cases, the patient refused the recommended treatment; 2 were due to tumor progression; in 4 cases, the deviation was a medical decision. In 5 cases, deviation consisted in the patient's death before treatment initiation: 2 following severe sepsis, 2 following inhalation pneumopathy, and 1 following massive hemorrhage. Table 4 shows reasons for deviation. Deviation was more frequent when surgery followed by radiation therapy was recommended (15 patients), than in case of chemotherapy (5 patients) or chemoradiotherapy (3 patients) (Table 5). Age, gender, tumor site and treatment modality showed no significant association with deviation.

The mean interval between MDTB and treatment initiation was 21 days (range, 1-74 days): 21 days for surgery, 22 days for chemotherapy, 28 days for chemoradiotherapy, and 27 days for

palliative chemotherapy (Table 6); the longest interval was for radiation therapy (32 days), due to the need for preparation, especially in interstitial radiation therapy. In cases of simple surveillance or of support care in palliative treatment, the date of the board meeting was taken as the date of initiation.

## **Discussion**

Since 2005 in France, MDTBs have been mandatory in cancer treatment [2], but there are no guidelines for monitoring the outcome of board recommendations, and means of assessing efficacy are a matter of debate [8-9]. Very few studies have assessed concordance between board recommendations and actual treatment, and only 1 focused on head and neck cancer; the others concerned other sites (Table 7).

The present study assessed MDTB recommendations for each new patient, with retrospective analysis and comparison against actual treatment. The discordance rate was 8.4%, in agreement with the literature: the single study focusing on head and neck cancer reported almost exactly the same rate [10]. The present series is the largest consisting exclusively of head and neck cancer.

The main cause of deviation was treatment complications, in 10 cases, with 6 cases of poor chemotherapy tolerance impairing general health status and requiring change of molecule or termination; 3 patients developed postoperative complications (infection, with transfer to ICU) requiring implementation of adjuvant radiation therapy instead of adjuvant chemoradiation therapy; and in 1 case radiation therapy was interrupted for more than 4 days (suboptimal treatment). Complications and tolerance are unpredictable, and require special attention in patient selection and nutritional preparation when surgery is indicated, and support care adapted to complications related to chemotherapy or radiation therapy.

The second most frequent cause of deviation was patient refusal (8 cases). This highlights the importance of involving the patient in the board's decisions. In case of refusal, the patient



needs to be given time to decide and schedule an early appointment with his or her physician to finalize the decision and, if need be, take an appointment with an onco-psychologist and/or nurse. Four patients went on to accept the proposal they had declined in the board meeting, after the protocol had been made more clear in a subsequent consultation with their community physician or oncologist. Although high, the refusal rate was lower than in the study by Hollunder, analyzing the same parameters but in head and neck, sarcoma and neurology MDTBs, with 36.5% refusal overall but 45.5% for head and neck cancer; the authors advocated patient presence in meetings, so that his or her preferences could be taken directly into account, avoiding misunderstandings [10]. It was, in this regard, shown that patient presence did not increase anxiety, and was a source of satisfaction [2].

The third reason for deviation concerned new clinical input (4 cases), such as comorbidities or new clinical findings, not available in the original board meeting; this was also reported elsewhere [11-14]. In one case, a cardiologic assessment performed after the meeting precluded the palliative chemotherapy envisaged and symptomatic treatment was initiated instead. In another case, the MDTB had under-staged the lesion and, after a radiotherapy consultation and centering CT, exclusive radiation therapy was replaced by chemoradiotherapy. For two patients referred from other centers with imaging data that predated the MDTB by more than 8 weeks, the board decision was made conditional on reassessment, which found lesion aggravation sufficient to preclude resection; palliative chemotherapy was indicated instead. In the light of the above, in preparing the file for the MDTB the most exhaustive and up-to-date information on the patient's health status is needed [15]. Especially when treatment involves heavy surgery or chemoradiotherapy, health status needs assessing in terms of comorbidities, to foresee tolerance (although no parameters enable this to be determined at present). More systematic risk assessment in the MDTB would reduce the rate of protocol deviation.

Systematic MDTB discussion should reduce the interval between diagnosis and treatment, by enhancing coordination between health professionals [16]. In the present study, the mean interval was 21, 22 and 32 days respectively for surgery, chemotherapy and radiation therapy. These results are due to pretreatment preparation, which is longer for chemotherapy and radiation therapy. In surgery, delay concerns operating room availability [16-17]. These intervals are, however, satisfactory, matching those of a previous report for diagnosis-to-treatment interval (rather than MDTB-to-treatment) [18]. A recent Editorial on time to treatment in head and neck cancer reported that time to consultation in the USA increased from 88 to 119 days between 1993 and 2013, and in France varied between 14 and 13 days, depending on geographical region. This interval was not studied here, as data were not systematically available for some patients referred from other centers. The authors of the Editorial found that diagnosis-to-treatment time was increased by 3 factors: tumor stage IV, chemoradiotherapy, and management in a university hospital. Regarding chemoradiotherapy, this is consistent with the present findings. Finally, time to treatment is an independent factor for survival, especially when >46 days, as was the case for some of the present patients [19]. However, time to treatment in the present series rarely led to delayed treatment initiation that might entail tumor progression or death before treatment, which were related to very rapid progression (<15 days) or very advanced stage, requiring further improvement in the care pathway [20].

The present study suggests that analyzing deviation from the MDTB protocol is useful for evaluating the performance of the meeting. Factors for deviation, such as comorbidity, can be identified and focused on in MDTBs. The study, like others, also highlighted the importance of patient involvement in the meeting, to reduce rates of refusal, which remain high [2 ; 6]. In each MDTB meeting, exhaustive completion of the database serving as support should not

only improve the quality of the discussion but also help optimize treatment proposals, ideally without deviation [10].

The present study had certain limitations. The impact of deviations on survival and quality of life was not assessed; this could be done in a future study. Treatment recommendations were made in line with regional and international guidelines, but conformity to guidelines was not assessed; this could be done as part of an overall assessment of MDTB quality, including concordance between recommendation and actual treatment and between recommendations and guidelines, with impact on overall survival. There is no standard means of assessing deviation rates, and it would be useful to establish one. The present study involved biases related to the retrospective design, and the fact that data were collected by a single investigator, who examined both MDTB recommendations and actual treatments.

### **Conclusion**

The present study demonstrated the importance of assessing concordance between MDTB recommendations and actual treatment, in order to evaluate MDTB quality. Analysis and, where possible, correction of factors for deviation should improve patient management. A large majority of patients in the present series (>90%) received the recommended treatment. Deviations were mainly due to toxicity or complications, patient refusal and lack of prior information on comorbidities. The study highlighted the importance of patient involvement in decision-making, to reduce refusal rates. More precise initial assessment of health status and comorbidity should reduce the risk of deviation between board recommendations and actual treatment.

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**Figure 1: Inclusion flowchart of patients discussed in MDTB.**

**Table 1:** Reasons for deviation of treatment from board protocol

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<b>Reasons for deviation</b>	<b>Definition</b>
Patient refusal	Patient refused recommended treatment.
Physician decision	Comorbidity of health status required deviation.
Death	Patient died before treatment initiation.
Tumor progression	Change in protocol required by rapid progression.
Treatment complication	Deviation required by side-effects or complications of treatment

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**Table 2:** Patient characteristics (*n* = 344)

	No. (%)
<b>Age at presentation (years)</b>	
< 45	23 (6.7)
45 – 59	93 (27)
60 – 74	183 (53.2)
≥75	45 (13.1)
<b>Gender</b>	
Male	265 (77)
Female	79 (23)
<b>Risk factors</b>	
Mixed intoxication	175 (50.9)
Smoking	63 (18.3)
Alcohol	6 (1.7)
None	100 (29.1)
<b>Treatment phase</b>	
Initial	297 (86.3)
Postoperative	47 (13.7)
<b>Primary site</b>	
Oral cavity	107 (31.1)
Oropharynx	76 (22.1)
Larynx	73 (21.2)
Hypopharynx	36 (10.5)
Nose and sinus	23 (6.7)
Salivary glands	12 (3.5)
Nasopharynx	7 (2)
Lymphadenopathy without known primary	6 (1.7)
ear	4 (1.2)

**Table 3:** TNM staging and histology (*n* = 344)

	No. (%)
<b>TNM stage</b>	
Tis	6 (1.8)
T1	81 (23.5)
T2	92 (26.7)
T3	43 (12.5)
T4	116 (33.7)
Tx	6 (1.8)
N0	193 (56.1)
N1	37 (10.7)
N2	85 (24.7)
N3	29 (8.5)
M0	341 (99.1)
M1	3 (0.9)
<b>Histologic type</b>	
Squamous cell carcinoma	294 (85.5)
In-situ carcinoma	6 (1.8)
Adenocarcinoma	12 (3.5)
Cystic adenoid carcinoma	5 (1.3)
Carcinoma ex pleomorphic adenoma	4 (1.2)

**Table 4:** Reasons for deviation of treatment from board protocol (n = 29)

Reasons for deviation	n (%)
Patient refusal	8 (27.6)
Physician decision	4 (14.8)
Death	5 (13.8)
Tumor progression	2 (6.9)
Treatment complication	10 (34.5)
Postoperative complication	3 (10.3)
Poor tolerance or side-effects of radiation therapy	1 (3.4)
Poor tolerance or side-effects of chemotherapy	6 (20.7)

**Table 5:** Deviations according to type of protocol (*n*=29)

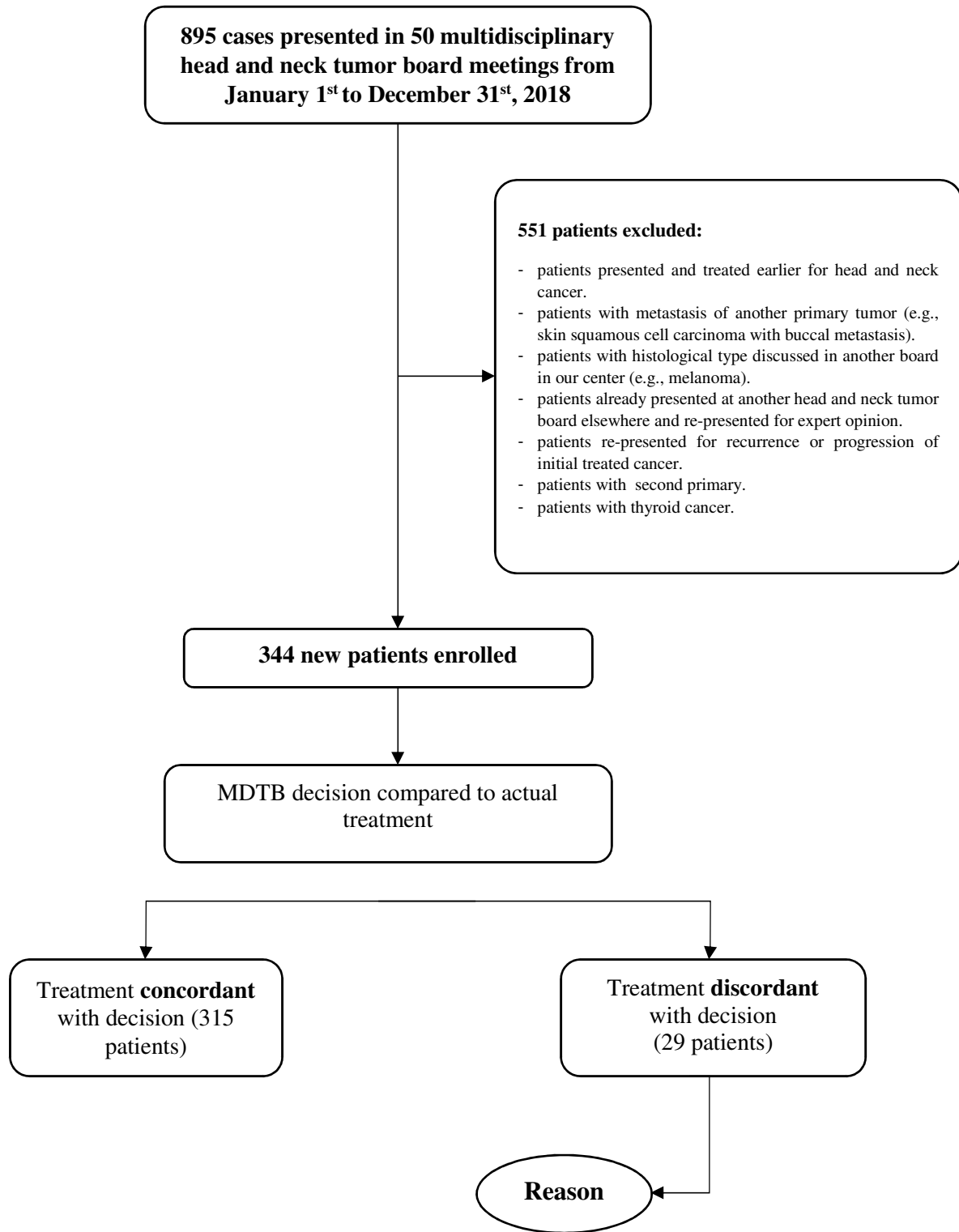
Type of protocol	n (%)
Primary surgery	3 (10)
Exclusive radiation therapy	2 (6)
Primary chemotherapy	5 (17)
Chemoradiotherapy	3 (10)
Surgery and radiation therapy/chemoradiotherapy	14 (51)
Surgery or radiation therapy/chemoradiotherapy	2 (6)

**Table 6:** Time to treatment according to type of protocol (*n* = 344)

Recommended treatment	n. (%)	Mean (days)
Primary surgery	54 (15.7)	21
Exclusive radiation therapy	53 (15.4)	32
Primary chemotherapy	21 (6)	22
Chemoradiotherapy	37 (10.7)	28
Surgery and radiation therapy/chemoradiotherapy	3 (0.9)	23
Surgery or radiation therapy/chemoradiotherapy	116 (48)	21
Palliative radiation or chemo-therapy	16 (4.6)	27
Support care	20 (5.8)	
Surveillance	24 (6.9)	

**Table 7:** Literature data on concordance between MDTB recommendation and actual treatment

Reference	MDTB region	<i>n</i>	Deviation (%)
Rajan et al. (2013) <sup>(9)</sup>	Breast	2,956	146 (4.5)
Hollunder et al. (2018) <sup>(10)</sup>	Brain	2,176	(7.5)
	Head and neck	1,319	(9.3)
	Sarcoma	320	(8.8)
Lutterbach et al. (2005) <sup>(11)</sup>	Brain	500	45 (9)
Blazeby et al. (2006) <sup>(12)</sup>	Esophagus, stomach, pancreas	271	41 (15.1)
Leo et al. (2007) <sup>(13)</sup>	Ling	344	15 (4.4)
Present study	Head and neck	344	29 (8.4)



**Figure 1: Inclusion flowchart of patients discussed in MDTB.**