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Utilité de la tomographie thoraco-abdomino-pelvienne chez les patients âgés hospitalisés pour altération de l'état général

Usefulness of thoracic-abdominal-pelvic tomography in older adults hospitalized with alteration of general state

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## Abstract

**Purpose:** Alteration of the general state of health is a frequent clinical situation as reason for hospital admission of older adults, although there is no consensus on criteria of the diagnostic approach. Our objective was to study whether thorax, abdomen and pelvis tomography is useful for the diagnosis and determination of a specific care pathway for hospitalized patients over 80 years old with alteration of the general state without identified clinical explanation.

**Methods:** retrospective observational monocentric study at a French University Hospital, with inclusion of all hospitalized patients who had a tomography following for alteration of general state without identified clinical explanation between January 2019 and June 2020.

The primary endpoint was the presence of a diagnosis on the tomography report.

**Results:** we studied 48 files of patients (aged  $86.2 \pm 3.4$  years on average). Tomography provided a diagnosis in 60.4% of cases. Factors significantly related to usefulness of tomography were weight loss and duration of weight loss. Among the diagnosed patients, specific actions were taken for 86.2% of them.

**Conclusion:** Our study suggests that thoracic-abdominal-pelvic tomography is useful to examine the alteration of general state in older patients without identified clinical explanation, particularly for those presenting with unintentional weight loss. That suggest that it is probably preferable to use the correct symptoms description instead of alteration of general state.

**Keywords:** Cachexia, Weight loss, Computed Tomography, Clinical Relevance

## Résumé

Introduction : L'altération de l'état général est une situation fréquente parmi les motifs d'hospitalisation des personnes âgées, bien qu'il n'y ait pas de consensus sur les critères ni sur l'approche diagnostique. Notre objectif était d'étudier si la tomodensitométrie thoraco-abdomino-pelvienne est utile pour le diagnostic et la détermination d'un parcours de soins spécifique pour les patients hospitalisés pour altération de l'état général sans orientation clinique évidente et âgés de plus de 80 ans.

Méthodes : étude monocentrique observationnelle rétrospective dans un hôpital universitaire français, avec inclusion de tous les patients hospitalisés ayant une tomodensitométrie suite à une altération de l'état général sans cause évidente entre janvier 2019 et juin 2020. Le critère de jugement était la présence d'un diagnostic sur le compte-rendu de la tomodensitométrie.

Résultats : nous avons étudié 48 dossiers de patients ( $86,2 \pm 3,4$  ans en moyenne). La tomodensitométrie a permis de poser un diagnostic dans 60,4% des cas. Parmi les patients diagnostiqués, des mesures spécifiques ont été prises pour 86,2 % d'entre eux.

Conclusion : Notre étude suggère que la tomodensitométrie thoraco-abdomino-pelvienne est utile pour évaluer une altération de l'état général sans cause clinique évidente chez les patients âgés.

Mots clefs: Cachexie, Perte de poids, Tomodensitométrie, pertinence clinique

## Points clefs

- En cas d'altération de l'état général sans cause clinique évidente, la tomodensitométrie thoraco-abdomino-pelvienne permet de poser une orientation diagnostique 6 fois sur 10
- Lorsque c'est le cas elle oriente la décision thérapeutique 8 fois sur 10
- La notion d'altération de l'état général souvent utilisée en France devrait être évitée.  
La notion de perte de poids involontaire est probablement préférable

## 1. Introduction

In January 2020, people over 80 years old represented 6% of the French population and 12.5% of the hospitalized patients [1]. Causes for hospitalization included diseases of the circulatory system (19%), trauma (15%), and respiratory diseases (13%) [1]. However, up to 8% of referrals were related to investigation of symptoms or examination anomalies without clear diagnosis orientation [2]. When symptom investigation in older adults is considered, alteration of the general state of health (AGS) is a frequent reason for hospitalization. However, there is little literature available on this specific reason [3]. Moreover, this “AGS” expression does not exist in the International Classification of Diseases version 11 (ICD 11), which includes the following terms (as unique and independent codes) that are classically constitutive of an AGS: fatigue (MG22), excessive weight loss (MG43.5), anorexia (MG 43.7) and decreased appetite (MG 43.8) [4]. Thus, AGS remains a vague entity of the medical semiology, a term often used by French physicians to characterize a rather frequent condition, which may affect up to 28% of geriatric patients, according to Aouaneche [5]. AGS is usually defined by a combination of symptoms: anorexia, asthenia, and weight loss, all three included as factors of Fried frailty phenotype, which add the walking speed and physical activity [6]. Considering that 2 factors or more defined frailty for Fried, AGS can be view as a proxy of frailty. The triad is then frequent, but sometimes difficult to confirm because of the subjective nature of anorexia and asthenia. In the literature, the main diagnoses associated with AGS are acute illness (51%), and more particularly infections (44%) [3]. The imprecision of the semiology associated with AGS can easily lead to the overuse of complementary examinations (biological and imaging), which may not be indicated [7, 8]. Moreover, none of the symptoms of AGS were cited in the American College of Radiology appropriateness criteria [9].

In the diagnostic approach of AGS, there is two situations: the clinical examinations can lead to suspect a cause (usually inflammatory, tumor or infectious) or the clinical examinations could be normal or not contributive. In this situation of AGS without identified clinical explanation, it is usual to begin the assessment with biology (notably blood cell count and inflammation biological markers). If no orientation is obtained at the end of the biological workup, it is often recommended to carry out radiological examinations (thoracic radiography, abdominal ultrasound) but with little evidence [10, 11]. After the biological and after -or instead of- these radiological examinations, if there are still no diagnostic orientation, there are no evidence in the literature to choose the better approach [12]. However, it is common practice to suggest a Thorax Abdomen and Pelvis Computed Tomography in such cases (TAP-CT) [12–15]. CT is a non-invasive, rapid acquisition examination using X-ray technology. In 2018, the number of CT procedures performed in France for older patients hospitalized was around 3.1 million [2]. The number of these examinations generates costs, transportation needs, and sometimes extension of hospital stay duration while waiting for these examinations, thus increasing the risk of iatrogenic dependence following hospitalization [16].

Considering the scarcity of evidence concerning usefulness of TAP-CT in the assessment of AGS, the main objective of this study is to determine whether TAP-CT provides a diagnostic answer in cases of older patients with AGS without identified clinical explanation, which is the definition of TAP-CT usefulness that we adopt here. The second endpoint is to determine if a diagnostic answer leads to a complementary examination, specific treatment, which can include medication, intervention of a specialist or the beginning of palliative care. In a second phase, we analyzed factors associated with a greater impact on TAP-CT usefulness. The aim of this secondary analysis is to evaluate in which medical context the performance of this examination is more relevant.

## 2. Method

### 2.1. Study Design

We conducted a single-center, observational and descriptive design, carried out at a French University Hospital. The inclusion period of this retrospective study was from January 1, 2019 to July 1, 2020. Inclusion criteria were age 80 or older, TAP-CT for AGS, and hospitalization in a medical department. In order to identify the patients to be included, we used the radiology software of the University Hospital (Xplore®), which preselected all the TAP-CT performed during the period of interest on patients aged 80 or older. A search was carried out every month between January 2019 and July 2020 using the keywords "alteration of the general state" and its abbreviation in French. We excluded patients for whom the indication stated a febrile syndrome because we wanted to explore the usefulness of TAP-CT without identified clinical explanation for AGS. Moreover, we excluded patients from surgical departments because indication were different in nature (pre or post-surgery notably). Once the patients preselected, we collected their clinical data recorded in the computerized medical file (DxCare®). Other exclusion criteria were known cancer (active, under treatment or in remission for less than 5 years), persons under legal protection and those deprived of liberty. Finally, we excluded cases in which we found in the computerized record two symptoms associated with the same system, which could be clinically suggestive of a diagnosis (e.g. vomiting and diarrhea, dyspnea and edema of the lower limbs, lymph nodes and night sweats or pruritus, anemia and blood exteriorization, palpable mass with biological abnormalities).

Collected data were anonymized, protected and only used for the purpose of this project.

After new Hospital policy was enacted in May 2020, all the patients who came to the University Hospital were informed individually about the collection of their data, as well as



collectively via University Hospital website. Before this period, for patients who were hospitalized between January 2019 and May 2020, we sent an information letter and asked, in accordance with the law, if they were opposed to this secondary use of their clinical data with prepaid envelope answer. Three weeks after the sending of the information letter, data collection started for patients who had not manifested their opposition. In accordance with French law, we collected data of deceased persons who had not expressed an opposition before dying. We checked vital status of patients at the end of the data collection period (May 2021) on the open access database "deces.matchid", which contains death data produced by National Institute of Statistics and Economic Studies and is publicly available [17]. The University Hospital recorded a commitment which ensured that the research process comply with the legal reference methodology for this type of study (MR-004).

## 2.2. Collection method

We obtained relevant data for the study from the computerized medical file (Dxcare®): we checked the discharge letter, clinical notes, and biological results of the Hospital laboratory. We also listed the department where the patient was admitted at the time of TAP-CT request, the time duration between hospital admission and request and time to completion of the TAP-CT. Collected data included: age; gender; housing (personal home, long-term facilities); walking status (capacity to walk with or without assistance, incapacity to walk). We assessed comorbidity by the age-adjusted Charlson score, a weighted comorbidity score validated and recognized to be associated with one-year mortality [18]. For the calculation of this score, we defined renal failure as a creatinine clearance under a threshold of 60 mL/min/1.73 m<sup>2</sup>, in accordance with national consensus [19]. We look for number of drug lines in the admission prescription list. A drug line is a therapeutic molecules or association of molecules in a single presentation, prescribed routinely or on request, regardless of the pharmaceutical form. We

also collected following biological data: C-reactive protein, leukocytes, hemoglobin and albumin. We listed symptoms classically described in cases of AGS, i.e. asthenia, anorexia, and weight loss (in kg) from clinical notes. Weight loss was most of the time declarative. We assessed duration of the weight loss based on clinical notes. We collected measured weight at admission in the files. Indeed, it is a quality indicator in France Hospital System to measure weight at entrance.

We checked TAP-CT radiologists' reports for presence or absence of a diagnosis as the main criterion. Secondly, we recorded and classified acts performed considering the TAP-CT results according to clinical notes: complementary examinations, specific therapy initiations, specialist's referrals, palliative care initiation or limitation of further exploration due to TAP-CT results. If none of these actions appeared to be a consequence of the TAP-CT, we classified the case as "no actions".

### 2.3. Statistical Analysis

Data were recorded in Microsoft® Excel. Categorical variables are expressed as numbers and percentages. Quantitative results are expressed as mean  $\pm$  standard deviation or median [minimum; maximum] if not normally distributed. In order to compare the 2 groups of patients according to the presence or absence of a diagnosis on TAP-CT, we used the Student's t-test (or the Mann-Whitney Wilcoxon test if necessary), for quantitative variables and Chi<sup>2</sup> test (or Fisher's exact test) for categorical variables. For the weight loss we expressed the result first as a categorical variable (presence or not) and secondly as a continuous variable (assigning 0 if patients did not suffered from weight loss). For duration of the weight loss we made the same choice assigning 0 months to patients with no weight loss. All statistical tests were performed with a significance level of 0.05. Statistical analyses were performed using SAS software, v.9.4® (SAS Institute, Cary, NC, USA).

### 3. Results

#### 3.1. Sample

The Xplore® software identified 7,981 TAP-CT performed at the University Hospital over the period of interest. Among them, 858 scans concerned patients over 80 years old, from which 108 fulfilled our inclusion criteria. Among them, we excluded 56 observation because of febrile syndrome or admission in surgical departments. After examining the remaining 52 files with the DxCare® software: 3 additional files were excluded, 2 for progressive cancer (scan in course of treatment), and 1 patient under guardianship. Finally, only one person objected by letter for the use of his data, so the sample was made up of 48 records for analysis (Figure 1).

#### 3.2. Description of the population

Our study population was 48 patients: 30 women (62.5%) and 18 men (37.5%). Table 1 reported their collected characteristics. Ages ranged from 80 to 96 years, with a mean of  $86.3 \pm 4.0$  years. The majority (85.7%) of patients lived at home, and 14.3% were residents in long-term care facilities. Only 2 out of 48 patients (4.5%) were not able to walk (with or without assistance) before their hospitalization. Charlson comorbidity score was  $> 5$  in 73.1% of cases and median number of medications was 7.0 [5.0 ; 9.0]. Concerning the symptoms motivating the performance of the TAP-CT, 29.2% had the classic triad of AGS (asthenia, anorexia, weight loss) explicitly documented in their clinical files. Asthenia was the most cited symptom (79.2% of patients), followed by weight loss (68.8%), anorexia (58.3%) and 52.0% reported at least 2 symptoms of the triad during their hospitalization. For two patients, we did not find any of the triad's symptoms on the scan request, although AGS was mentioned. Weight assessment showed a mean weight of  $58.0 \pm 10.7$ kg with a median

reported weight loss 4.25 [0.0 ; 10.0]. As a percentage of the initial reported weight, this represented a median loss of 7.0 [0.0 ; 15.0]. The median weight loss duration was 1.5 [0.0 ; 6.0]. The median CRP was 15.2 [7.6 ; 26.5] mg/L; Leucocytes median number was 7.15 [6.0 ; 8.8]G/L. The mean hemoglobin  $11.2 \pm 1.8$  g/dL of and  $35.9 \pm 5.2$  g/L for albumin. The department that requested a TAP-CT for AGS were mainly internal medicine (35.4% of requests), geriatric rehabilitation service (20.8%) and acute geriatric service (14.6%). Hospital stays ranged from 5 days to over 3 weeks, with 56.3% of patients having stay longer than 20days. Half of the TAP-CT requests were made within the first 3 days of hospitalization with half of the requests completed within 3 days of the request.

### 3.3. Outcomes

Of the 48 cases, 29 (60.4%) were found to have a suspected diagnosis explaining AGS on the TAP-CT. For 25 of these 29 patients (86.2%), at least one specific clinical action in relation to the TAP-CT was prescribed: complementary examinations (58.6%), specific therapy initiations (24.1%), specialist's referrals (48.3%), palliative care initiation (17.2%) and limitation of explorations (27.6%). At the end of the data collection (May 2021, i.e. 1-2 years after the hospitalizations), 60.5% (n=29) of the patients were alive.

### 3.4. Comparison of populations

We then compared the 2 groups of patients according to the presence or absence of a diagnosis on TAP-CT (Table 2). We found a significant association between the presence of weight loss and diagnosis on TAP-CT ( $p=0.05$ ). Patients with a diagnosis TAP-CT lost 7.0 [1.2 ; 13.0] kg, compared to 0.0 [0.0 ; 4.5] kg for patients with an inconclusive TAP-CT ( $p=0.02$ ) and the duration of the weight loss is longer when TAP-CT conclude to a diagnosis than when TAP-CT was inconclusive (1.5 [0.0 ; 6.0], 0.0 [0.0 ; 0.0 ; 4.0] months,

respectively,  $p=0.04$ ). Finally, vital status at the end of the study was related to the presence of a diagnosis on TAP-CT ( $p=0.03$ ). Other variables such as age, gender, housing and living arrangement, number of medications, Charlson comorbidity score and collected biological results were not related to the presence of a diagnosis on TAP-CT.

#### 4. Discussion

Our retrospective study focused on the diagnostic usefulness of TAP-CT in cases of AGS in older patients. The TAP-CT performed was associated with a diagnosis in 60.4% of cases, and action was taken in 86.2% of the diagnosed patients.

##### 4.1. Main results and external validity

To our knowledge, this study is the first to focus on the usefulness of TAP-CT for diagnostic purposes in patients presenting an AGS without identified clinical explanation. The population of this study seems to be representative of the older patients hospitalized in France. The average age was 86.3 years, with significant comorbidity according to Charlson score or median number of medication, which are comparable to available data for general population over 75 years (mean number of medication  $7.0 \pm 4.4$ ) [20]. AGS as defined by the triad (asthenia, anorexia, weight loss), represented 108/858 (12.6%) of all TAP-CT ordered for all older patients during the period. This proportion was somewhat less than previously reported in other French studies: between 20 and 45% of patients presented the 3 symptoms [3, 5] but with selection biases in the two studies that we have prevented by our selection on TAP-CT database. In our study, none of the AGS symptoms were noted in the file of 2 patients. This finding raises the question of the clinical meaning of the expression "AGS", which may be vague, encompassing many possible clinical states. For Berrut, the use of the acronym AGS would constitute a misleading terminology [21]. He describes this expression

as a sign of "clinical laziness", emphasizing that it is not a rigorous description of the semiology, and even less a diagnosis. However, clinical practice as well as our study reveal that it is frequently used. Indeed, symptomatology in older adults is variable, and constitutes a real geriatric issue, but also a marker of frailty, according to Jarrett [22]. The primary endpoint of our study was to evaluate the diagnostic usefulness of TAP-CT. The results of our study suggest that this examination is useful, since it seems to orient the diagnosis in 60.4% of cases. This figure seems to be in agreement with one of the few studies on that subject [13], conducted in Japan in 2018, which reported that TAP-CT contributed to the diagnosis of anorexia in 56.7% of patients. The performance of TAP-CT was estimated to be 33.0% only in the study of Goh [23], conducted in Singapore, but it seems to be explained by the inclusion of both inpatients and outpatients.

Among the results associated with the secondary objectives of our study, the main significant characteristic is weight loss and the duration of its evolution. This is the only objective symptom among the triad that can be quantified, which facilitates its collection. Weight loss is recognized as suggestive of undernutrition when it exceeds (or is equal to) 5% in 1 month or 10% in 6 months [24]. Furthermore, weight loss is a recognized predictor of mortality in older patients [25]. These results suggest that this symptom is a relevant indicator. In addition, specific care was provided for 86.2% of patients with a TAP-CT diagnosis. This figure could not be compared with other studies since we are not aware of any study on the usefulness of TAP-CT to the care process. We consider limitation for complementary explorations, or a decision for palliative care as one of the possible specific decisions made after a TAP-CT diagnosis, because prognosis information in short- or medium-term perspectives should not be underestimated indication for ordering a TAP-CT, even if it does not allow a curative approach. Prognosis understanding is useful for initiation of supportive

care or cessation of check-ups and possibly avoiding of hospitalizations, and better communication with patients and family or caregivers [26].

#### 4.2. Strengths and weaknesses

Despite the retrospective collection, there is no missing data on TAP-CT reports and little missing data in general. Our study inform on "real life" usefulness of the TAP-CT, with a population representative of the older patients hospitalized (mean age: 86.3 years), with many comorbidities. The main weakness is the sample size, which impaired the power of our comparisons in our secondary objective. The results of our study cannot be extrapolated to TAP-CT scans performed on an outpatient basis, or in other indications such as patients with cancers, and evocative symptoms associated with an AGS. We decided to focus on this condition without identified clinical explanation, and it did not focus on AGS that accompanied inflammatory syndromes. We did not exclude patients who had an inflammatory syndrome, which did not give a specific diagnostic orientation. We also did not distinguish between scans with and without injection. We acknowledge that injection may be one of the risks to be considered in the performance of a TAP-CT in the AGS. The frequency of acute renal failure as an adverse effect could be interesting to report in a future study.

#### 4.3. Contribution and relevance of care

TAP-CT seems to be useful in older patients with AGS when it has been ordered. It should not be concluded from our study that all older patients with AGS should be assessed using TAP-CT because some patients were not considered for this diagnosis or prognosis imaging. Indeed, the clinical situation and notably the clinical prognosis should be taken into account before considering TAP-CT [7, 27]. Other alternatives to TAP-CT are possible for exploration of AGS: positron emission tomography, abdominal ultrasound coupled with chest

X-ray, gastrointestinal endoscopy [28]. We are not aware of previous studies comparing their contribution to diagnoses of AGS to TAP-CT.

## 5. Conclusion

AGS is a frequent clinical situation in old age and is associated with diverse diagnoses, for which the etiological approach is not yet consensual. This study, carried out on a geriatric inpatient population aged over 80 years without clinical explanation for their AGS, suggests that TAP-CT can be useful, allowing a diagnostic orientation in up to 60% of cases, then leading to more than up to 80% of therapeutic proposals. The result is even more marked for patients for whom weight loss is the main symptom. In our sample, none of the factors considered was associated with a potential irrelevance (not leading to a diagnostic orientation) of the TAP-CT, which underlines the need for further studies on this issue. Finally, it is possible that we have to adopt a better way to identify the problem than the “AGS” expression, replacing it by unintentional weight loss when this symptom occurs and another explicit terminology for other situations (e.g. complex social situation), in view of ordering TAP-CT more appropriately.



The authors declare that they have no potential conflict of interest relevant to this article

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**Table 1.** Population characteristics. Caractéristique de la population

Characteristics	Total (n=48)	Missing data N (%)
Age	86.3 ± 4.0	0
Female Sex	30 (62.5%)	0
Personal home housing	41 (85.4%)	0
Able to walk		
Unassisted	20 (45.5%)	4 (8.3%)
Technical or human assistance	22 (50.0%)	
Unable to walk	2 (4.5%)	
Charlson comorbidity score		
[4-5]	13 (27.1%)	0
[6-7]	21 (43.8%)	
≥8	14 (29.2%)	
Number of medications	7.0 [5.0 ; 9.0]	1 (2%)
Symptoms		
Asthenia	38 (79.2%)	0
Anorexia	28 (58.3%)	
Weight loss	33 (68.8%)	
Weight (kg)	58.0 ± 10.7	3 (6.3%)
Weight loss		
Kilograms	4.25 [0.0 ; 10.0]	4 (8.3%)
Percent of the initial weight	7.0 [0.0 ; 15.0]	5 (10.4%)
Duration in months	1.5 [0.0 ; 6.0]	8 (16.7%)
Biology		
C-reactive protein (mg/L)	15.2 [7.6 ; 26.5]	3 (6.25%)

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Leukocytes (G/L)	7.15 [6.0 ; 8.8]	0
Hemoglobin (g/dL)	11.2 ± 1.8	0
Albumin (g/L)	35.9 ± 5.2	3 (6.25%)

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Qualitative variables are expressed as number (%). Quantitative variables are expressed as means ± standard deviations or median [minimum; maximum].

**Table 2.** Comparison of populations' characteristics by presence or absence of diagnosis on thorax abdomen and pelvis computed tomography TAP-CT.

Comparison des caractéristiques des patients en fonction de la présence ou de l'absence de diagnostic sur la tomodensitométrie thoraco-abdomino-pelvienne

Characteristics	TAP-CT with diagnosis orientation (n=29)	TAP-CT without diagnosis orientation (n=19)	P value
Age	86.1 ± 4.2	86.5 ± 3.7	0.77
Female sex	17 (58.6%)	13 (68.4%)	0.49
Personal home housing	25 (86.2%)	16 (84.2%)	1.00
Able to walk			
Unassisted	13 (50.0%)	7 (38.9%)	0.39
Technical or human assistance	11 (42.3%)	11 (61.1%)	
Unable to walk	2 (7.7%)	0 (0.0%)	
Charlson comorbidity score			
[4-5]	7 (24.1%)	6 (31.6%)	0.72
[6-7]	14 (48.3%)	7 (36.8%)	
≥8	8 (27.6%)	6 (31.6%)	
Number of medication	7.0 [5.0 ; 9.5]	8.0 [4.0 ; 9.0]	0.92
Biology			
C-reactive protein (mg/L)	15.9 [8.0 ; 28.4]	14.1 [5.2 ; 25.8]	0.69
Leukocytes (G/L)	7.0 [5.8 ; 9.0]	7.7 [6.2 ; 8.7]	0.32
Hemoglobin (g/dL)	11.0 ± 2.1	11.5 ± 1.1	0.36
Albumin (g/L)	35.7 ± 5.2	36.3 ± 5.2	0.70
Symptoms			



Asthenia	25 (86.2%)	13 (68.4%)	0.16
Anorexia	17 (58.6%)	11 (57.9%)	0.96
Weight loss	23 (79.3%)	10 (52.6%)	0.05 *
Weight	57.6 ± 10.0	58.4 ± 11.8	0.83
Weight loss (kg)	7.0 [1.2 ; 13.0]	0.0 [0.0 ; 4.5]	0.02 *
Duration in months	1.5 [0.0 ; 6.0]	0.0 [0.0 ; 4.0]	0.04 *
Palliative care decision	5 (17.2%)	1 (5.3%)	0.38
Limitation of explorations	8 (27.6%)	1 (5.3%)	0.06
Any type of diagnosis or therapeutic intervention during stay	25 (86.2%)	2 (10.5%)	< 0.0001**
Alive in June 2021	14 (48.3%)	15 (78.9%)	0.03 *

Qualitative variables are expressed as number (%) and analyzed with  $\chi^2$  test or Fisher test.

Quantitative variables are expressed as means with standard deviations or median [minimum; maximum] if not normally distributed and analyzed with Student's t-test or Mann-Whitney

Wilcoxon test. TAP-CT : Thorax Abdomen and Pelvis Computed Tomography in such

cases\*  $p \leq 0.05$ , \*\*  $p \leq 0.0001$

Figure 1. Flow chart of the study (TAP-CT signify Thorax Abdomen and Pelvis Computed Tomography and AGS signify Alteration of General State).

Diagramme de flux de l'étude (TAP-CT signifie tomodensitométrie thoraco-abdomino-pelvienne et AGS signifie altération de l'état général)

